

STUDENT ID #: 14143953; GROUP #: L

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

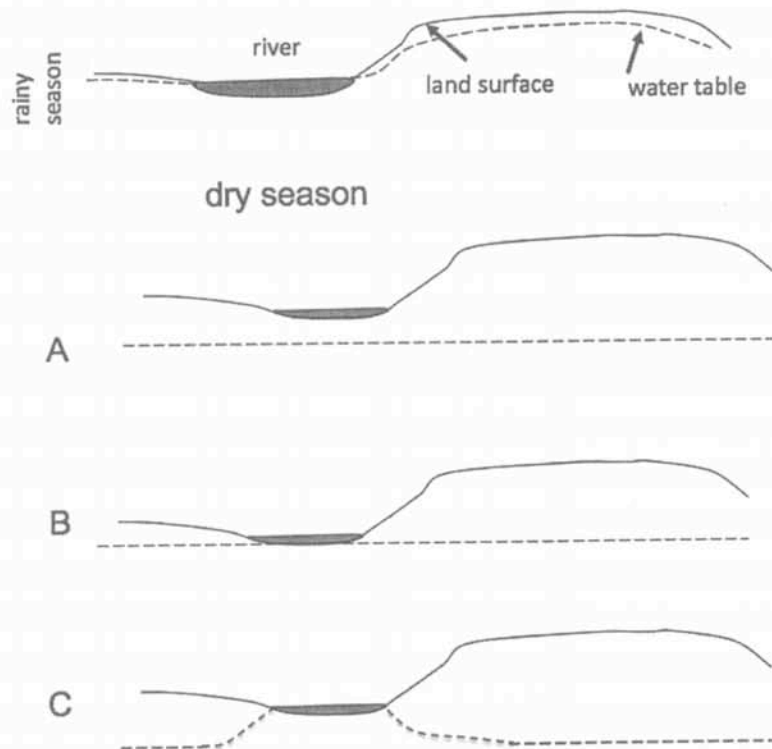
1. What happens when water molecules condense? 9
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
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 - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
 - a. A= evaporation, B= deposition, C= sublimation
 - b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
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 - a. Liquid water from the pot condenses
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6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

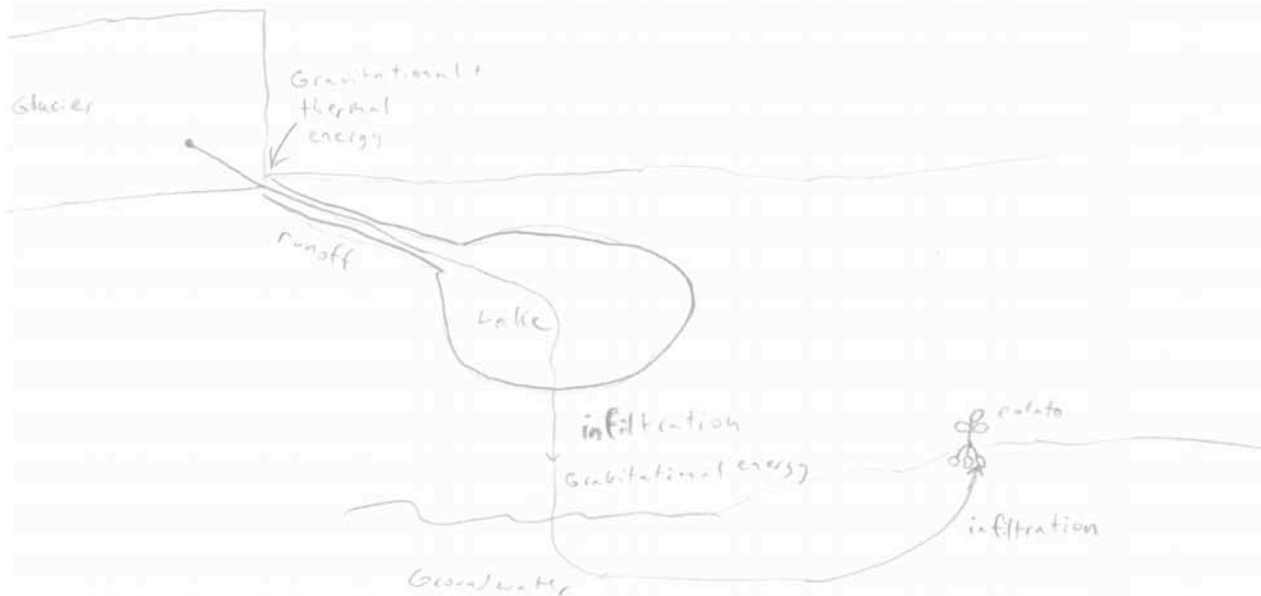
SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
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A water molecule in a glacier could move through melted runoff
to a lake. From the lake, it could infiltrate groundwater.
A potato plant could then absorb it through its roots.

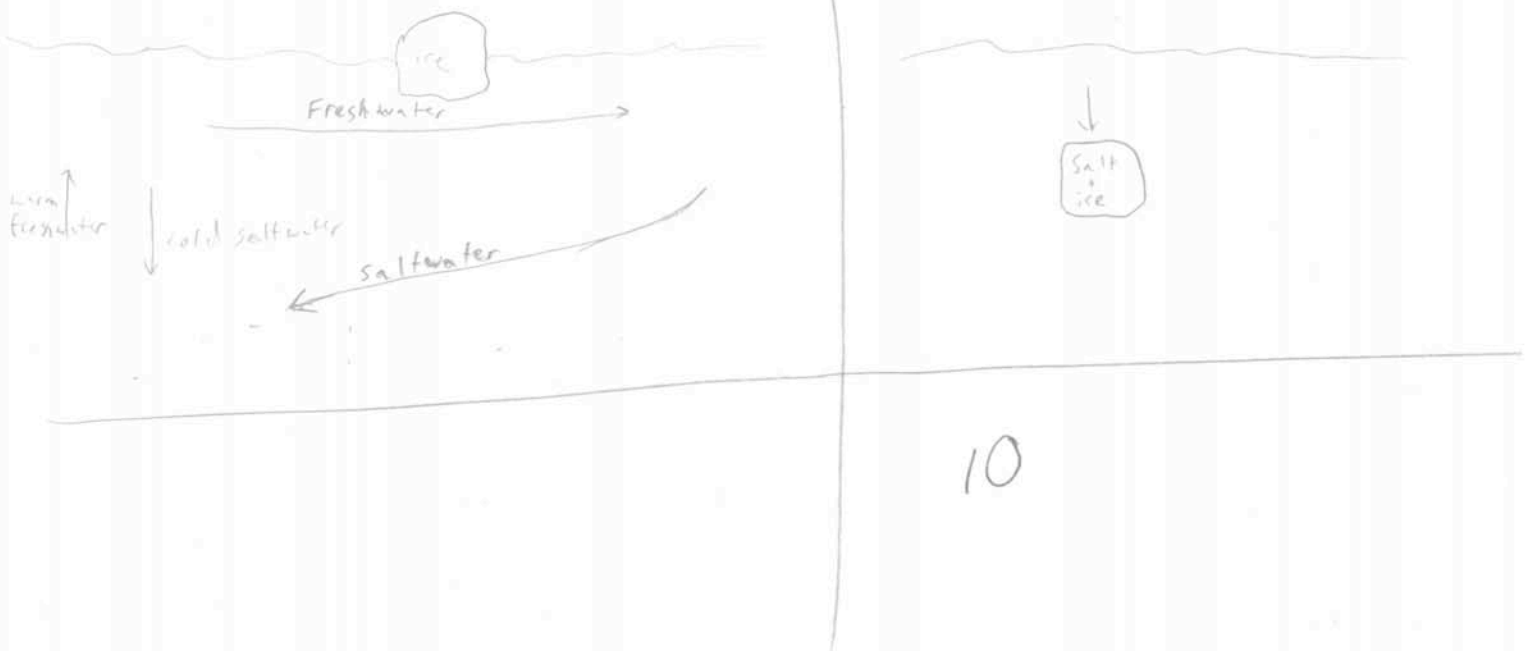
15



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
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Ice contains less salt than seawater because saltwater is denser than freshwater and freshwater is denser than ice. Because colder salt water is denser than warmer freshwater, the former sinks while the latter rises. This thermal energy causes circulation. If ice contained more salt than seawater, it would be more dense and would sink. This would increase sea level.



10

EXTRA CREDIT (2 points)

- 2 EC. How are burning wood and respiration similar?
- They both destroy matter during energy conversion
 - They both convert thermal energy into gravitational energy
 - ☒ They both convert chemical energy into thermal energy
 - They both convert kinetic energy into potential energy.

YOUR SCORE:

72

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A42204523; GROUP #: L

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

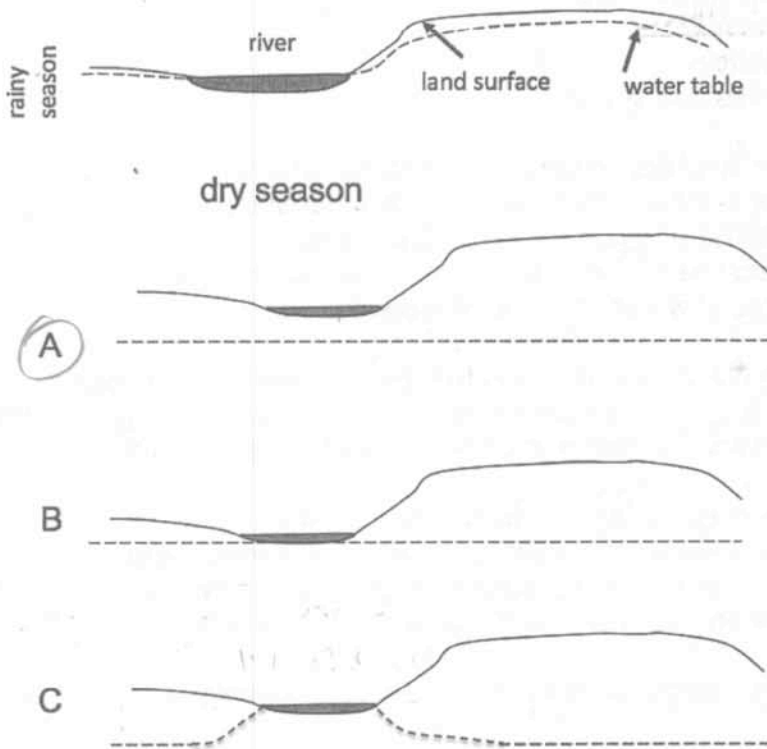
- 8
1. What happens when water molecules condense?
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

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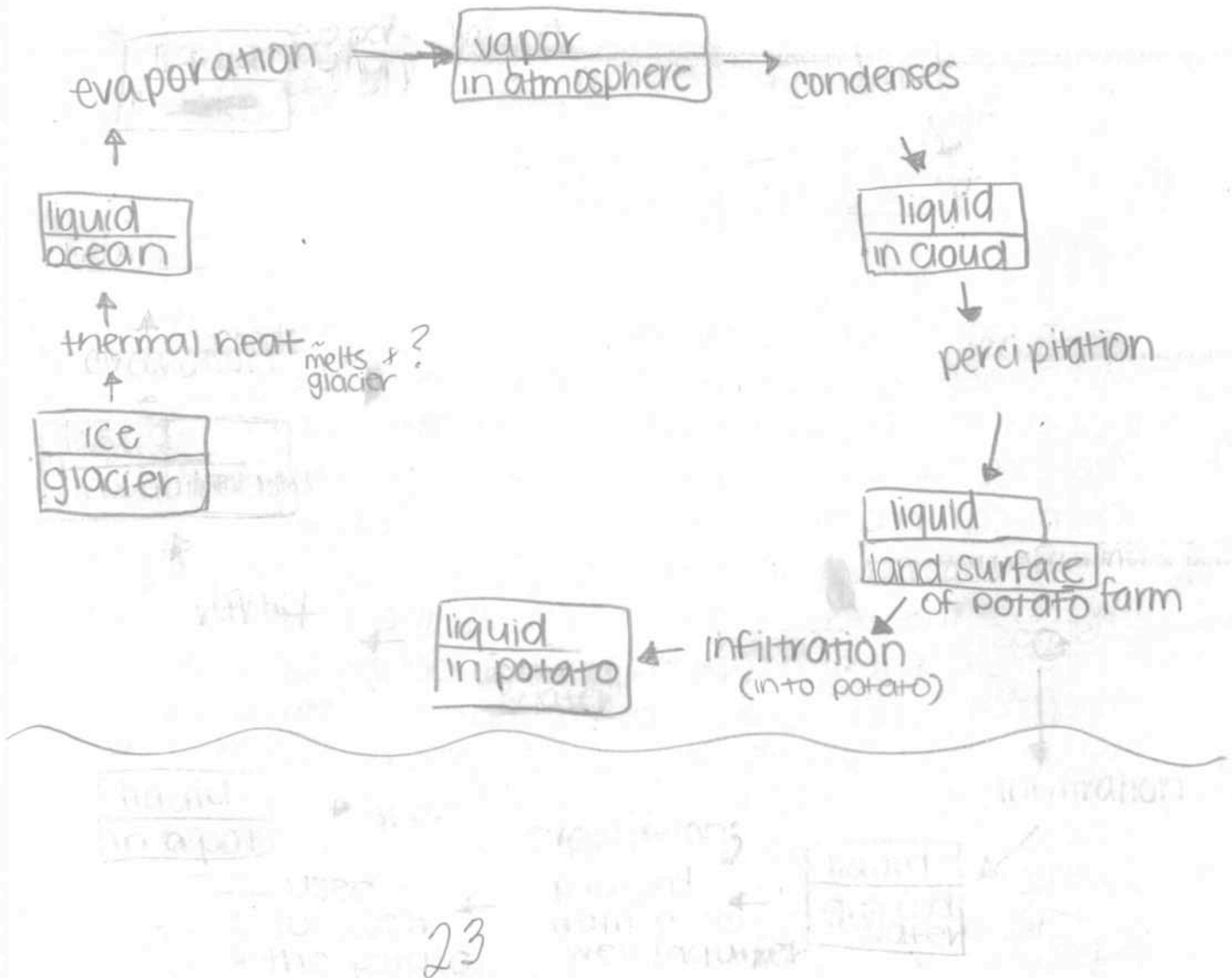
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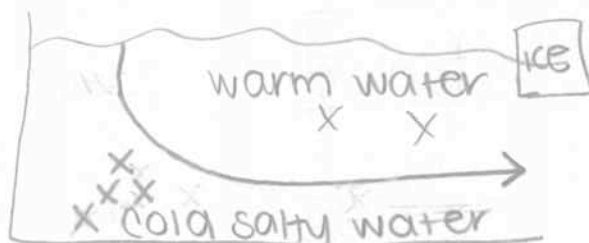
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SHORT ANSWER. 25 points each (50 points total)

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thermal &
chem
warm less den

2 If polar ice contained more salt than the surrounding sea water then the dissolved oxygen molecules would be greater in the water levels. The excess salt would increase thermal and chemical reactions heating up the water molecules and increasing density of the original water. The temperature would increase and not freeze as easily. Circulation happens in the ocean because of thermal and chemical reactions. warm water with less salt is less dense than cold water with more salt, so the warm water remains close to the surface while the cold water sinks.

in this case where polar ice contains more salt circulation would occur less quickly between freezing and melting states. more energy would be released during chemical reactions due to increased salt levels.

EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
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YOUR SCORE:

65

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A42065731; GROUP #: L

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

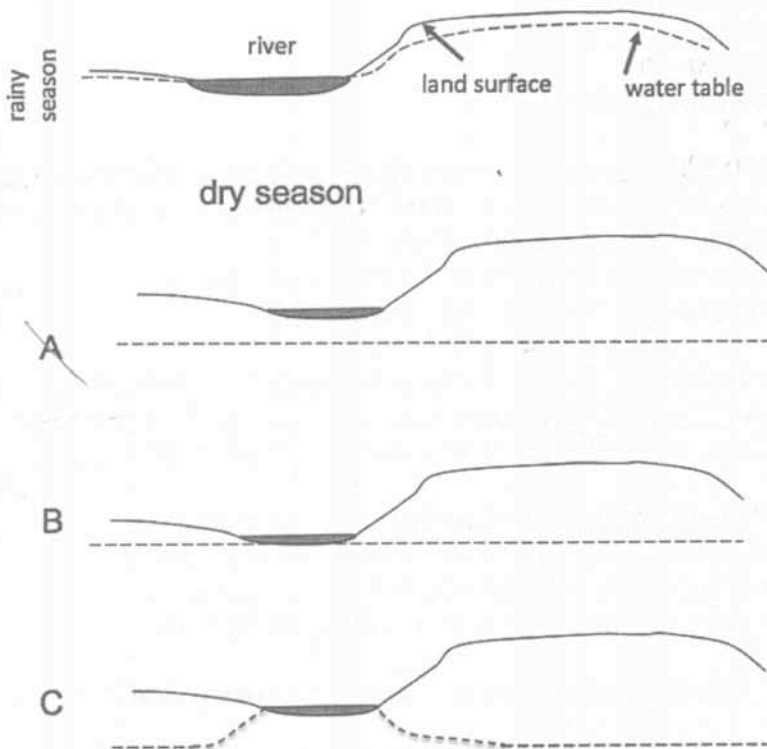
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

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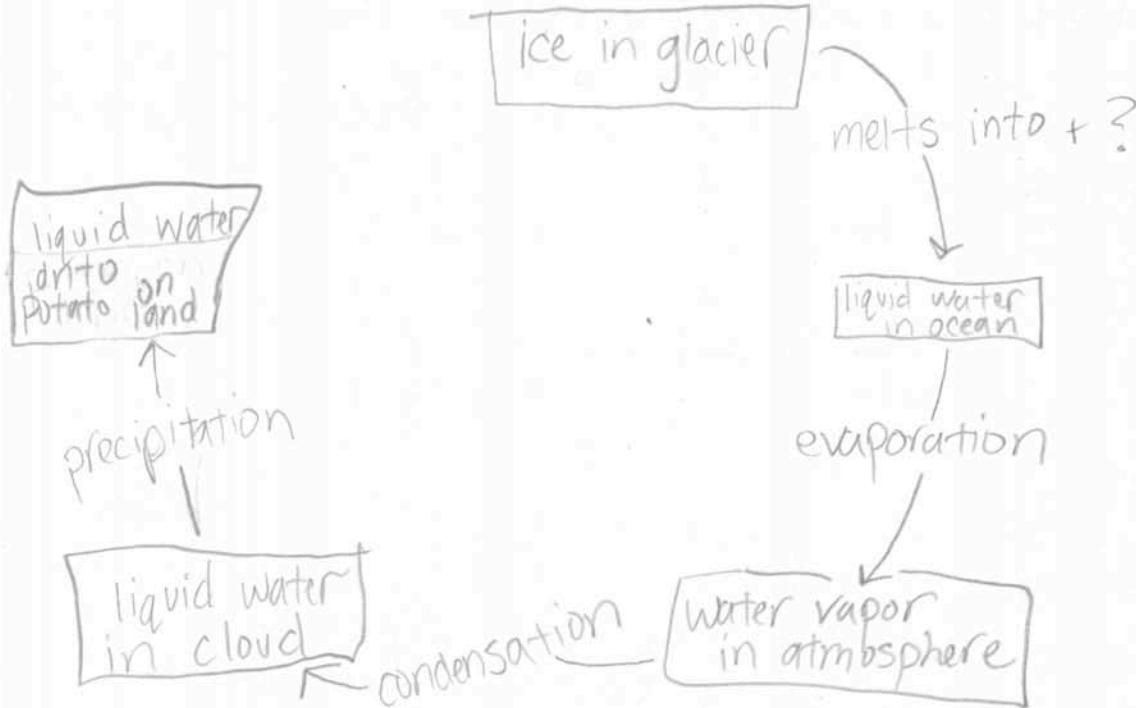
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9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
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If polar ice contained more salt than the surrounding seawater from which it freezes, there would be an increase in the amount of salt water added to thermohaline circulation. As a result of the increase in salt water, when the polar ice melted, the water, which is now more dense due to the increase in salt, has a higher density than the water so the circulation will move at a more rapid rate. Thermohaline circulation will continue to circulate the cooling surface saltwater to the cold depths of the ocean and allow the process to continue, only with more salt added to the mix.

5

2

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

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90

YOUR SCORE:

70

STUDENT ID #: A43499348 Ben Green; GROUP #: L

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- 6
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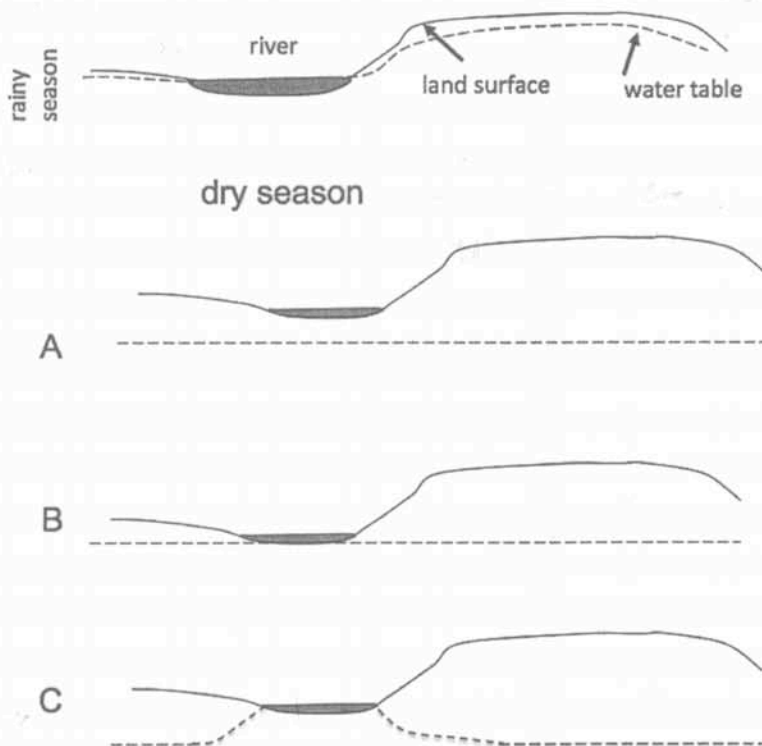
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

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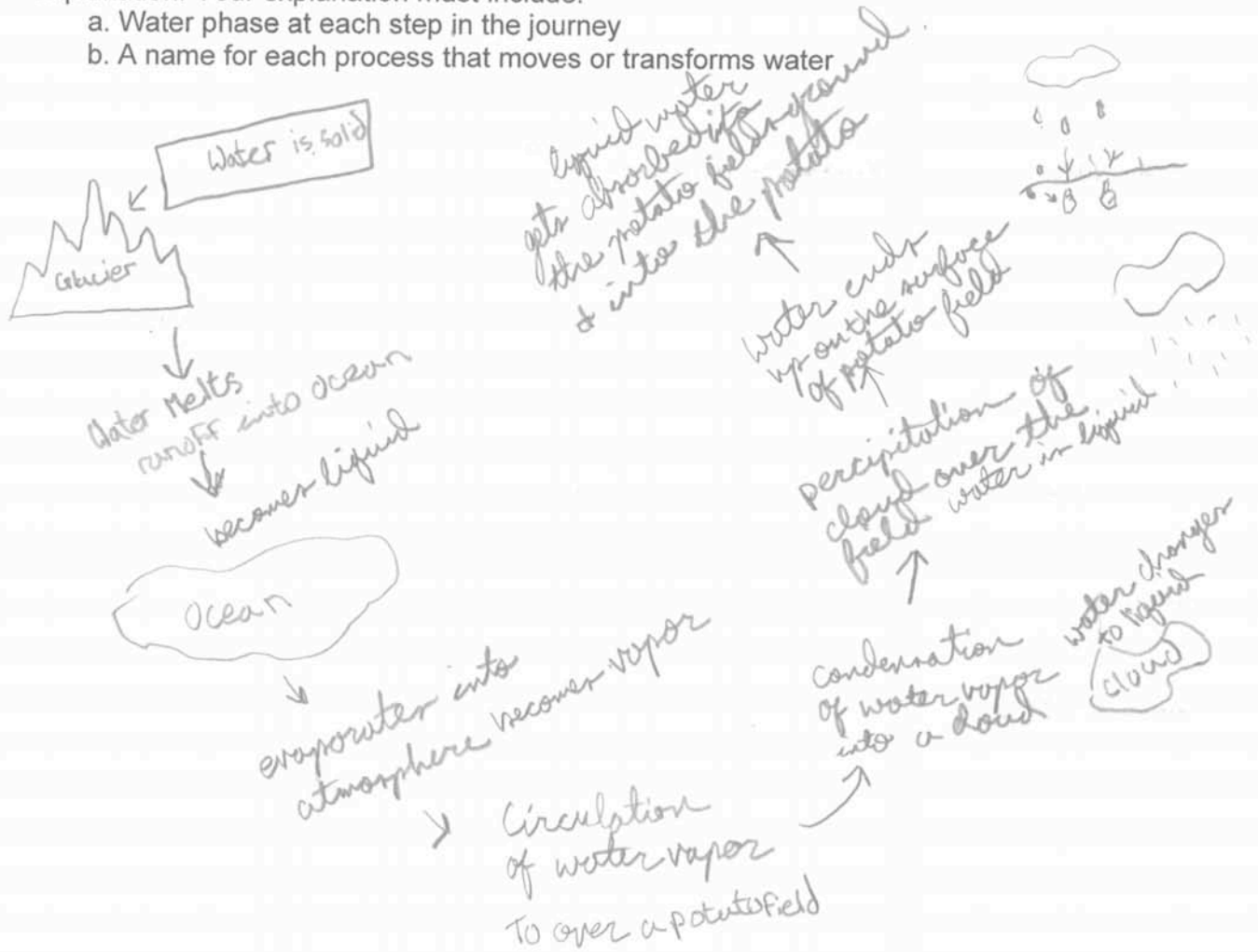


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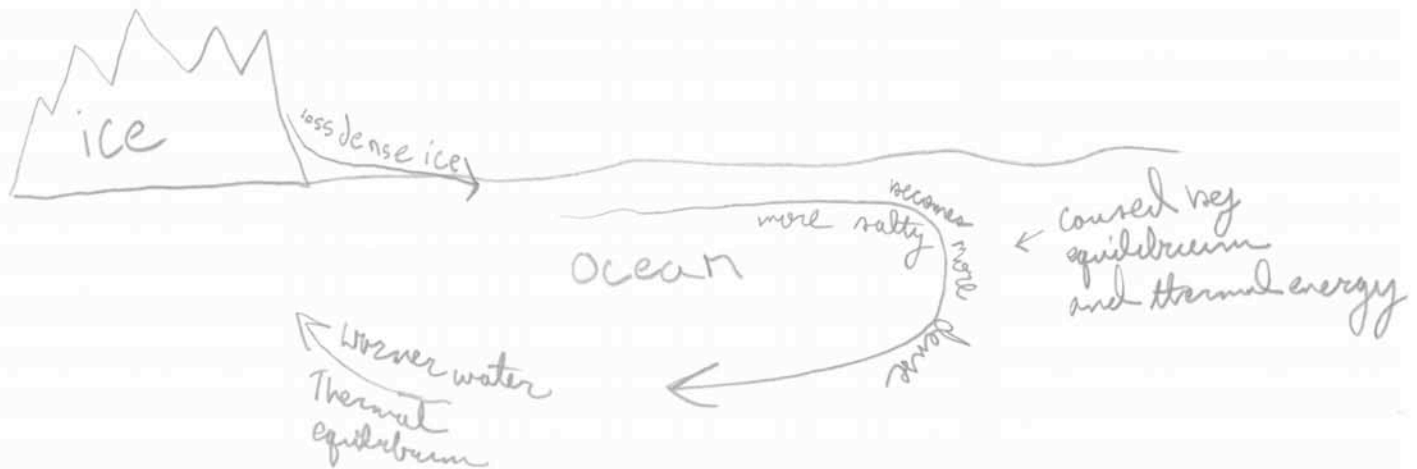


25

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The thermohaline circulation would slow down to a stop if polar ice contained more salt than the surrounding seawater. This would occur because the water would not need to circulate as much if the levels of salt were the same or, or more in the ice. This would cause the equilibrium to need no shift because all the water would be the same if not only having a difference in temperature.

5



EXTRA CREDIT (2 points)

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30 32

YOUR SCORE:

62

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

STUDENT ID #: A12773599; GROUP #: M

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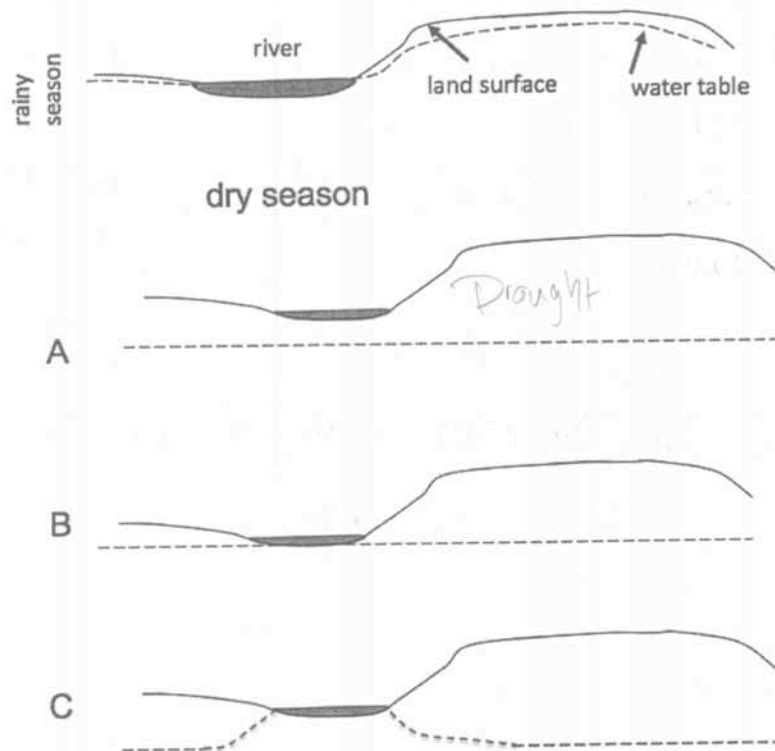
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The water in the glacier (supposing it is frozen) could melt to water (liq.) then evaporate into the atmosphere, ^{becoming gas} it could then cool off and condense into a cloud, (liq. water). The water could then reach the ground via precipitation (gravitational energy) there it could soak into the soil via gravity and a awesome potato can be growing right there and use that H_2O molecules.

25

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Circulation is caused by ~~the~~ equilibrium, water will move to make salt concentrations more equal, if ice, when it freezes, had more salt, that salt would be taken out of the ocean (liq.) therefore ~~the~~ water would move to ~~change~~ the poles to try to make the salt concentrations ? equal, this would lead to currents going to the poles ^{they do} leading to the poles being warmer ~~and~~ until it reached ~~when~~ a point where equilibrium would occur, (ice melting a little and making poles water 'salty-ier' again)

5

2

EXTRA CREDIT (2 points)

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40 32

YOUR SCORE:

72

STUDENT ID #: A34305310; GROUP #: M

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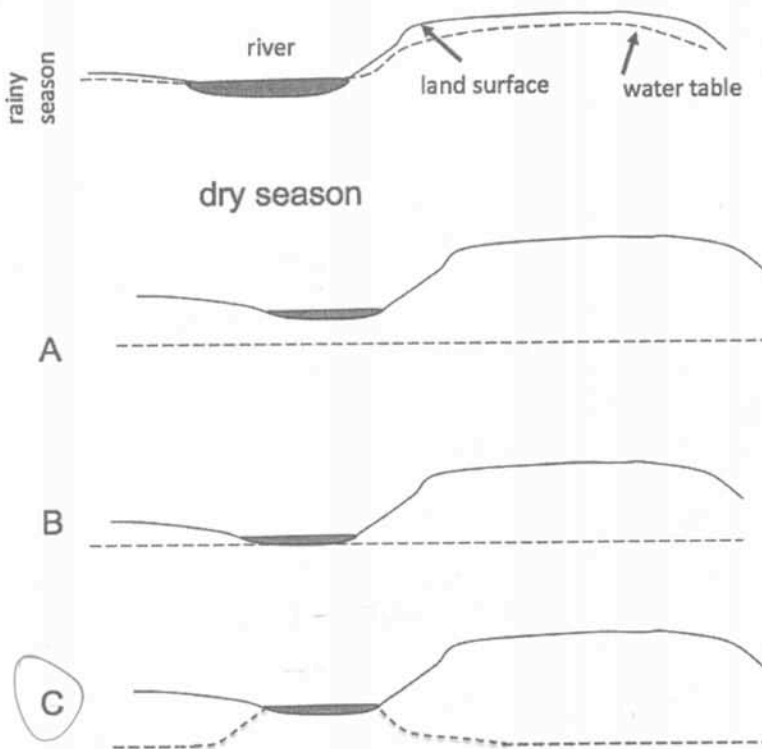
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- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

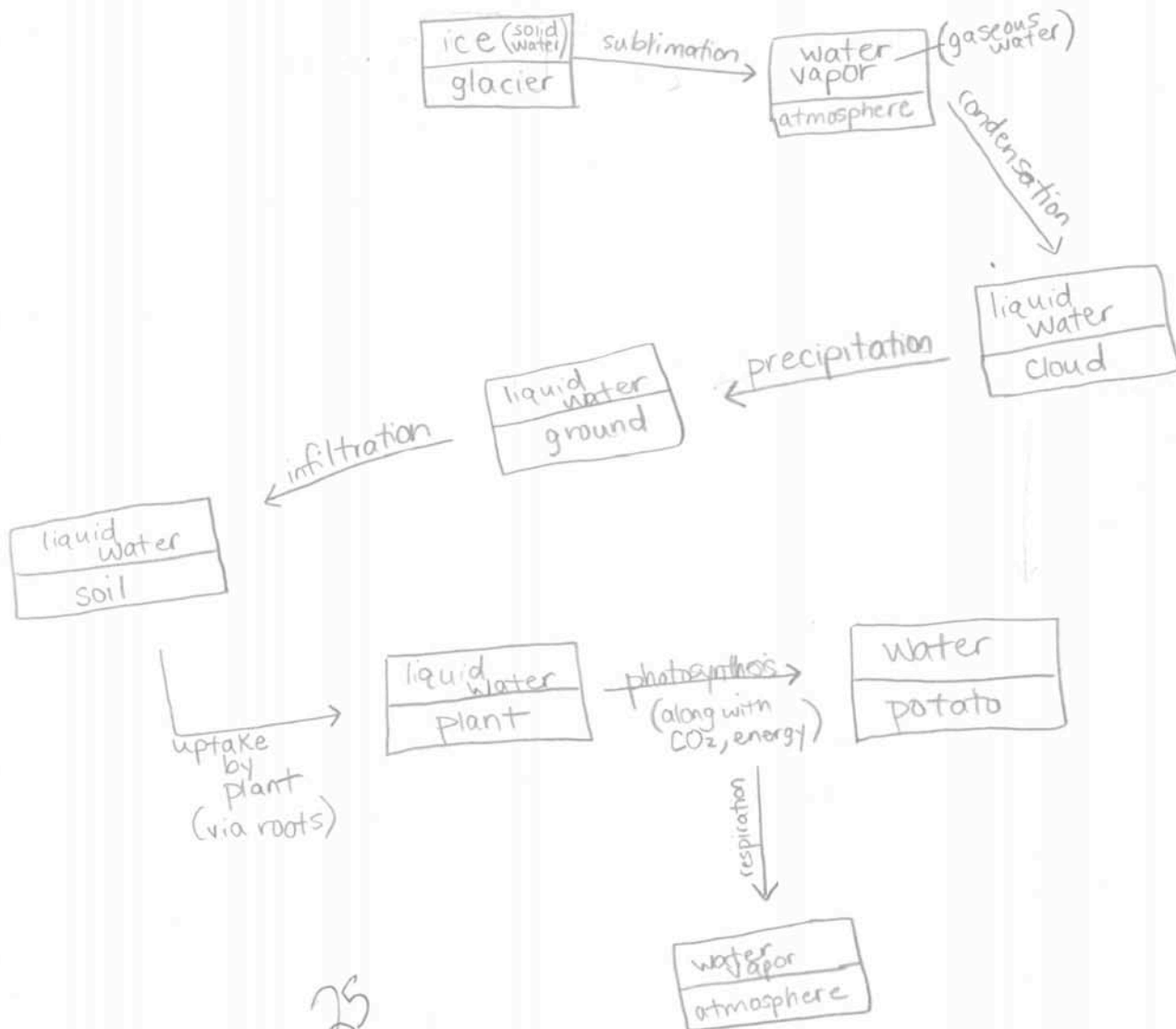


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

Thermohaline circulation is based off of two properties: temperature and salinity. Temperature drives circulation due to warmer water being less dense than colder water. In the oceans, warmer equatorial water moves poleward and is cooled. As it cools, it becomes more dense and sinks. Similarly, colder "pole water" moves toward the equator and as it is warmed, it becomes less dense and rises up. This creates a circulation pattern, which allows warm water to move poleward and colder water to move to the equator, driven by temperature differences. Wind currents, due to the uneven heating of the Earth, are what drive the physical movements of the water either poleward or toward the equator. Salinity also plays a role in this circulation as saltier water is more dense than less salty water. The circulation occurs because the waters near the equator are less salty than the waters near the pole, due to salts remaining in the water when ice forms. If the ice contained more salt than the waters around, this would make the "pole water" less salty. If there is no difference in salinity between the equatorial waters and the pole waters, there is no circulation due to salinity. Since thermohaline encompasses both temperature and salinity, if salinity were to be affected, but not temperature, thermohaline circulation would be weakened. This weakening could have tremendous effects on the overall global climate and overall circulation.

25

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

YOUR SCORE:

92

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: 448915317; GROUP #: M

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense? 8
 - a. Water molecules become larger
 - ☒ b. Gaseous water becomes liquid water
 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - ☒ c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
 - b. Seasonal high water from the Mississippi River
 - ☒ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
 - a. A= evaporation, B= deposition, C= sublimation
 - ☒ b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
 - a. Liquid water from the pot condenses
 - ☒ b. Liquid water from the pot evaporates
 - c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - ☒ a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

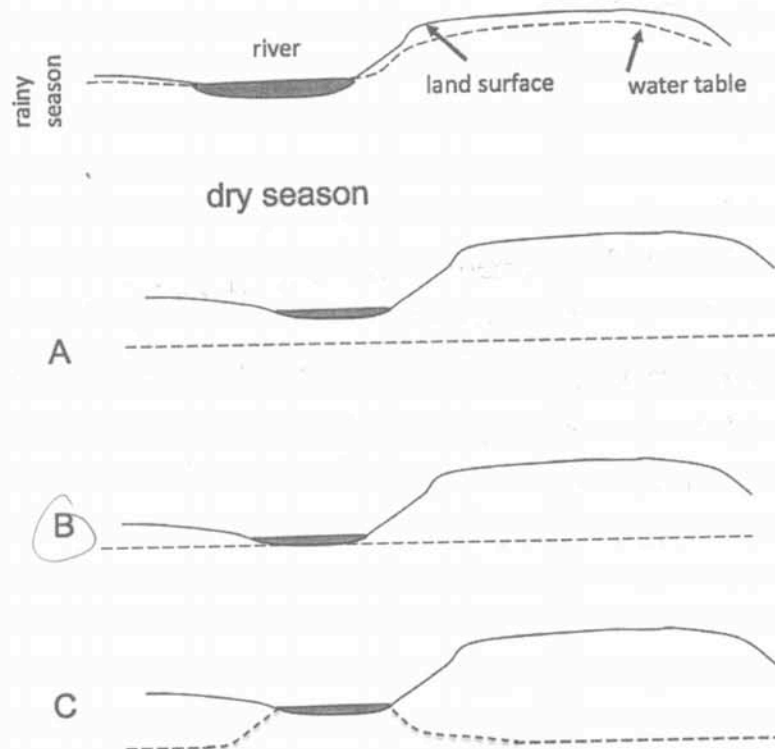
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

AB34
A43915317 2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- ☒ c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
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 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - ☒ c. Plants release energy

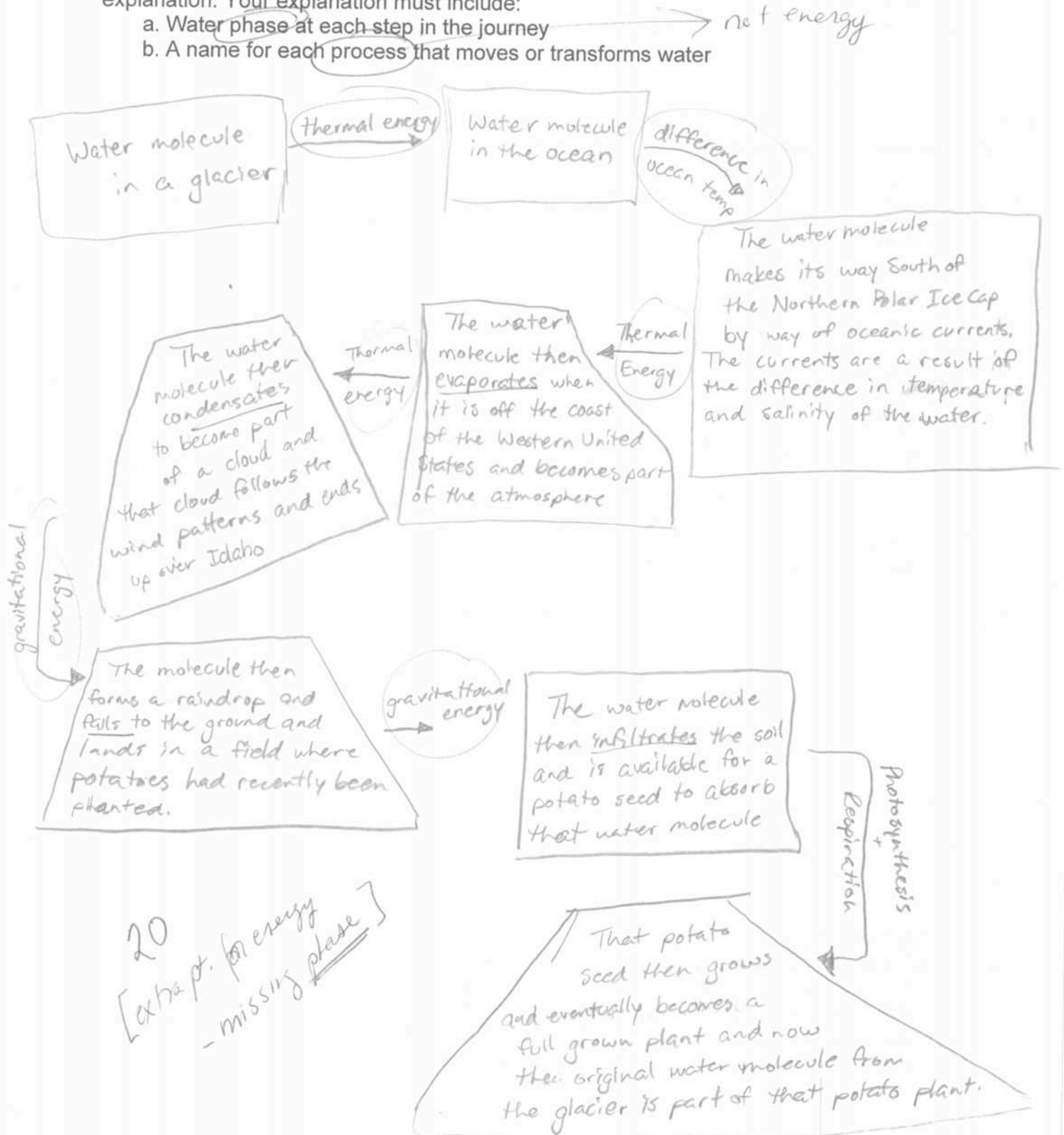
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

3

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

Thermohaline circulation in oceans would change if polar ice contained more salt than the surrounding seawater from which it freezes because the polar ice would trap more salt in the form of ice so there would be less salt in the surrounding seawater. This would result in less powerful thermohaline circulation because the currents would have to rely more heavily on the difference in water temperature and less on the salinity of the water. Circulation is a direct result of the difference in both water temperature and the amount of salt in the water. Both temperature and the amount of salt effect the density of the water. The temperature of the water relies on the amount of thermal energy going into the water.

10

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

40 32

YOUR SCORE:

72

42383975

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: 42383975; GROUP #: M

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

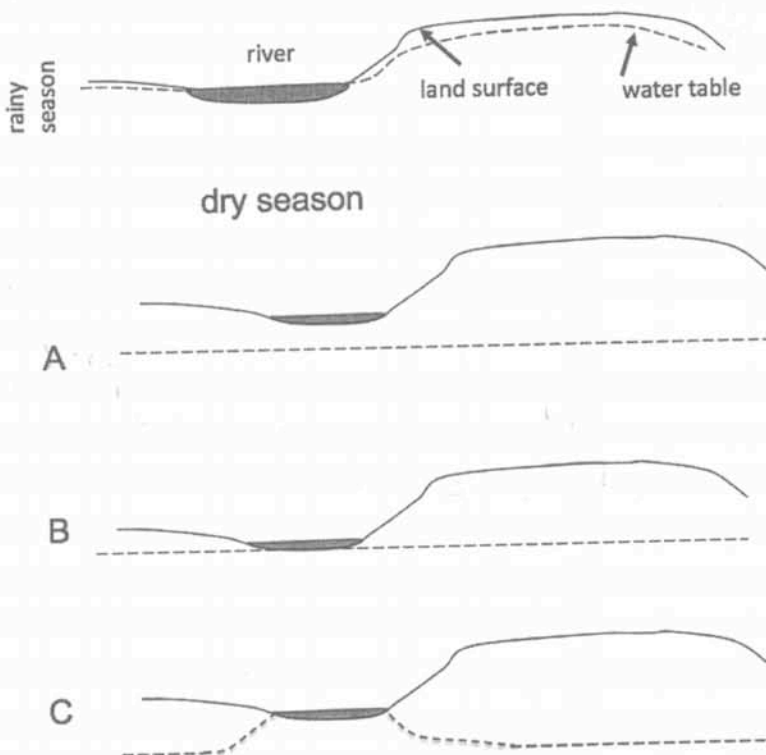
1. What happens when water molecules condense?
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. Rainfall and surface runoff into the lake
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c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
a. A= evaporation, B= deposition, C= sublimation
b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
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6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. This is what one would predict with global warming
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
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 - c. remained the same
10. What happens when plants respire?
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 - b. Plants convert energy into biomass
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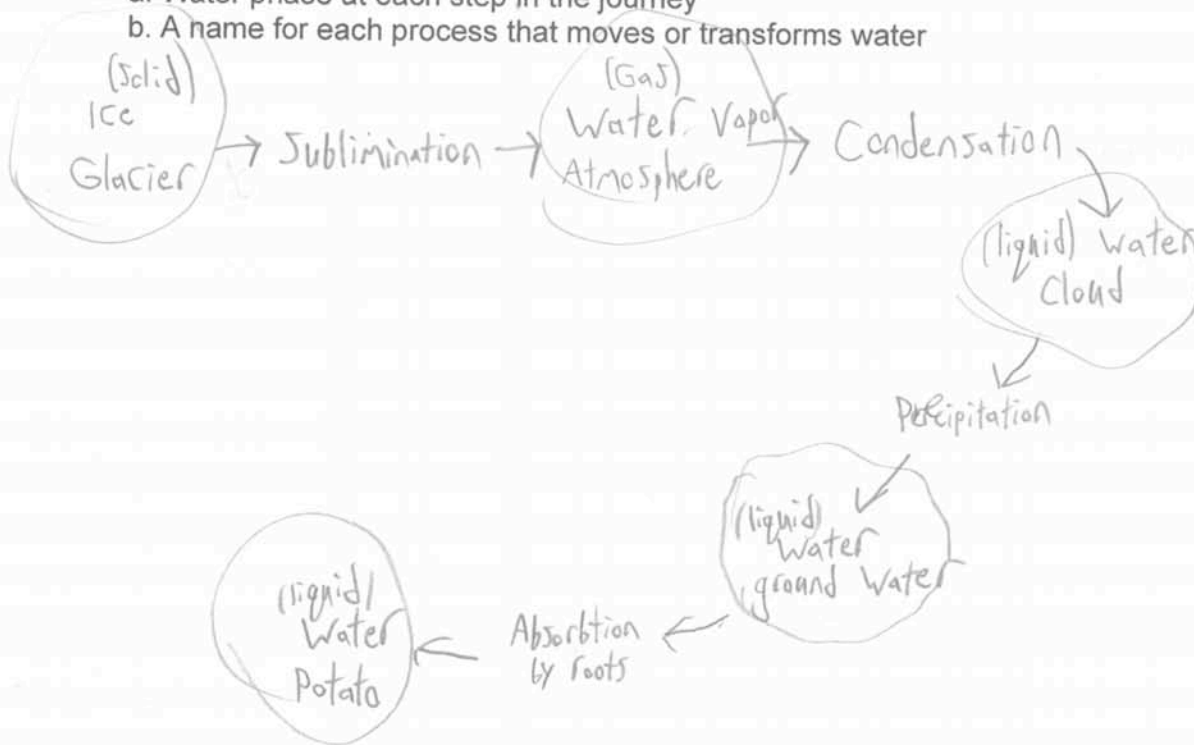
4 238 3975

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



25

2. When ice forms from seawater, the ice contains less salt than the remaining water. **Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes.** You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
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When water in the ocean freezes under these conditions the leftover water would be less salty than it was before. Since fresh water is cooler than that of salt water and this fresh water would be in the region around the poles where the ice would form. The cold water around the poles in the thermohaline circulation of the ocean drifts towards the equator to warm up. Since this water is cooler than usual it will take longer to heat up in the equator region of the ocean before drifting back down to the poles than it normally would in the circulation process, slowing it down and causing the currents to lose speed and power.

18

EXTRA CREDIT (2 points)

2

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

OK

45/45

YOUR SCORE:

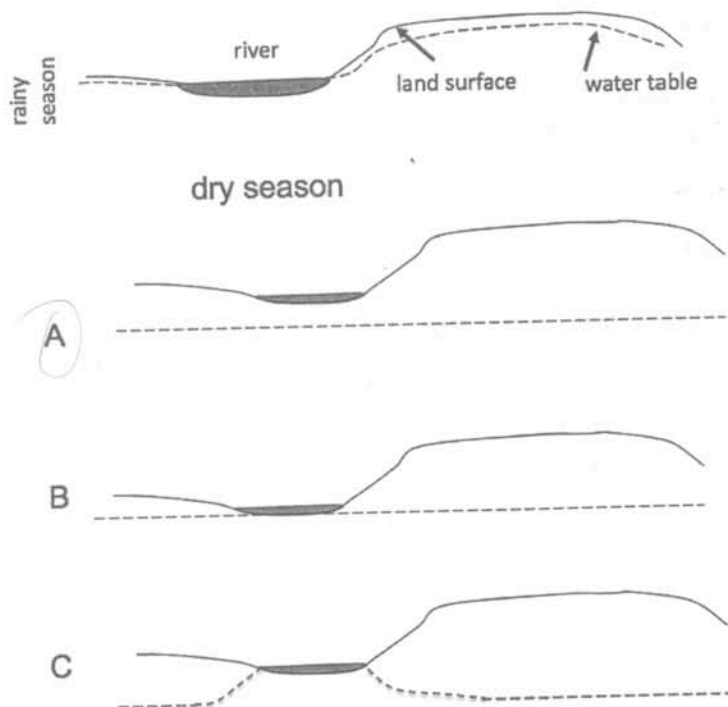
90

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

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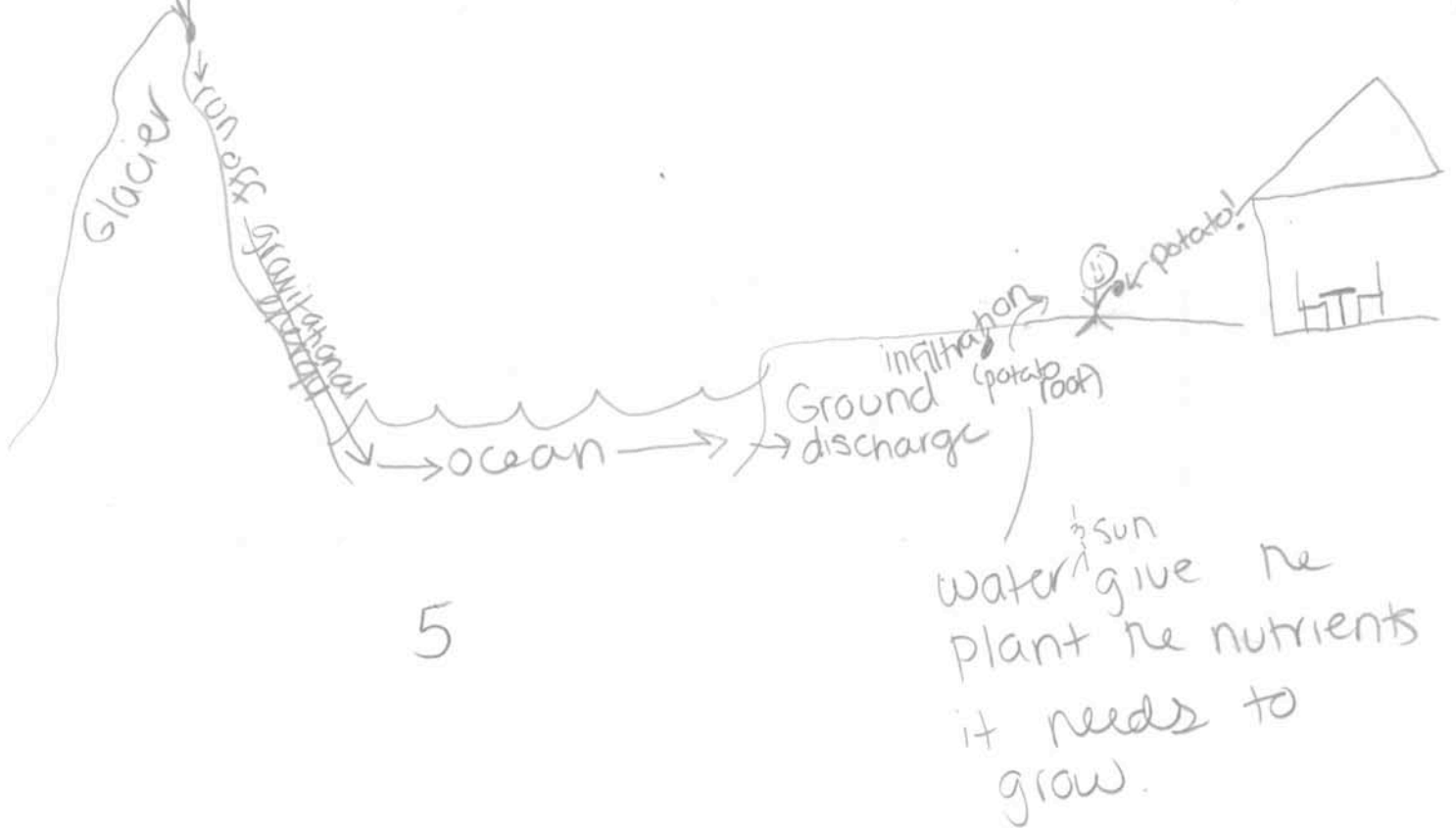
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9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
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5

STUDENT ID #: 143637 189; GROUP #: N**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

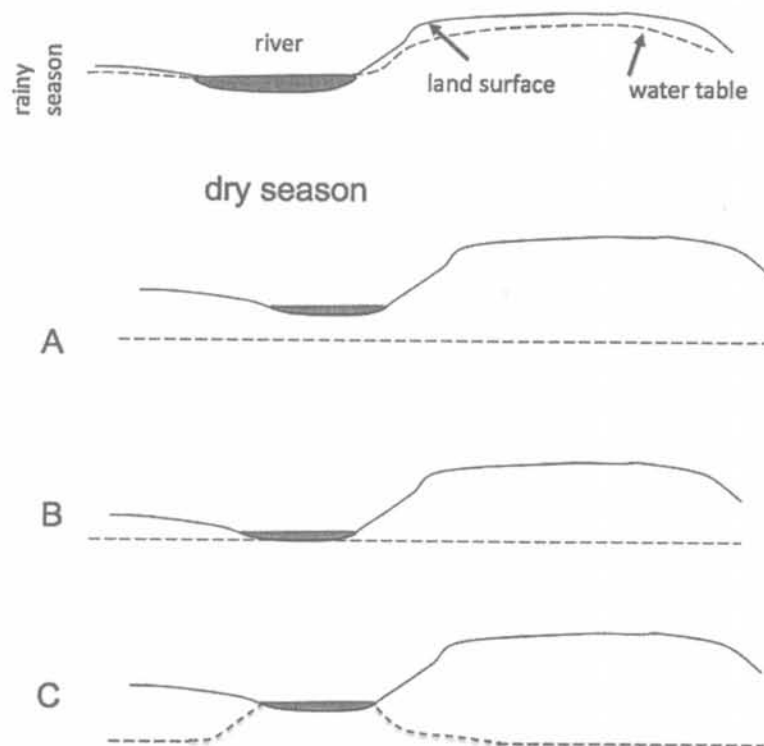
1. What happens when water molecules condense?
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

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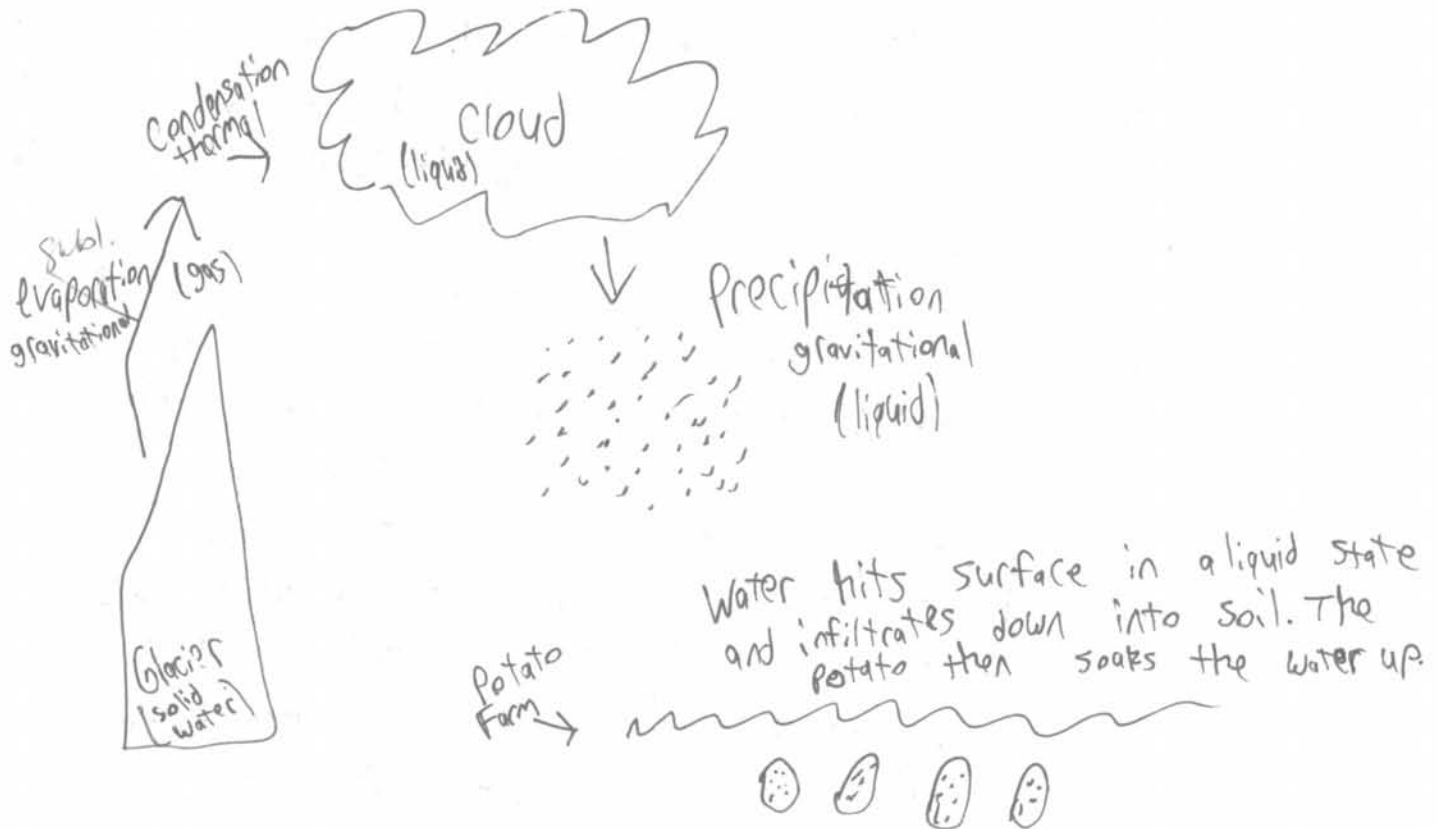


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- a. been greater
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43637189

SHORT ANSWER. 25 points each (50 points total)

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5

If polar ice contained more salt than its surrounding seawater, whenever it did melt and rejoin the seawater it would cause a general rise in the salt levels of the seawater because the salt would not just stay in the water it was originally in in the glacier, it would ^{circulate} ~~spread~~ throughout all the seawater. This would cause the seawater to freeze at a slower rate and raise the sea levels. Because it would be freezing at a slower rate, the water would spend more time under the sun, and its temperature would increase. ^{like the salt,} ~~the extra heat~~ the extra heat this water had would circulate ~~the~~ throughout the ocean to balance density (warmer water is less dense than colder water).

to balance out density

EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

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- d. They both convert kinetic energy into potential energy.

35 29

YOUR SCORE:

64

STUDENT ID #: A41107889; GROUP #: N

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

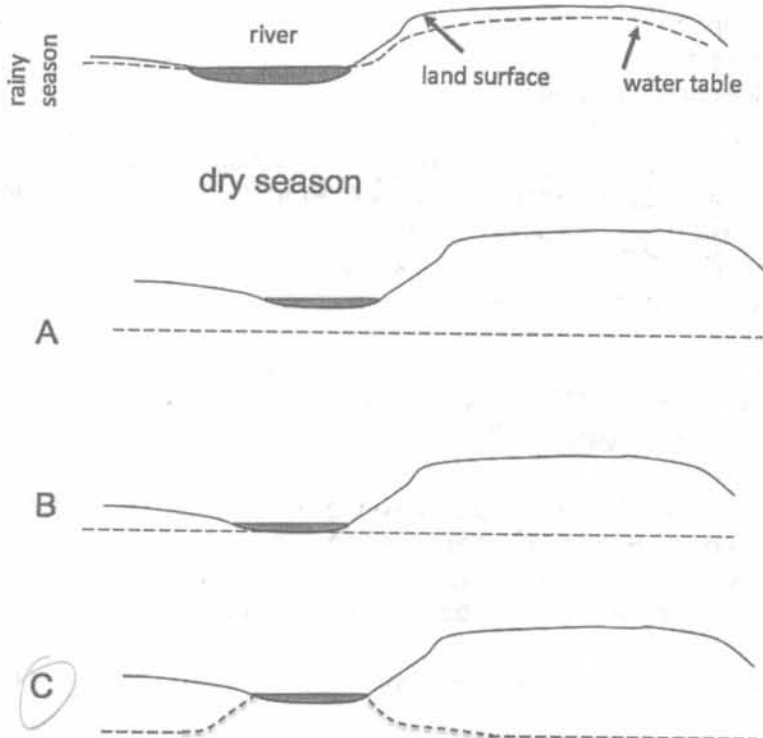
1. What happens when water molecules condense? 8
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

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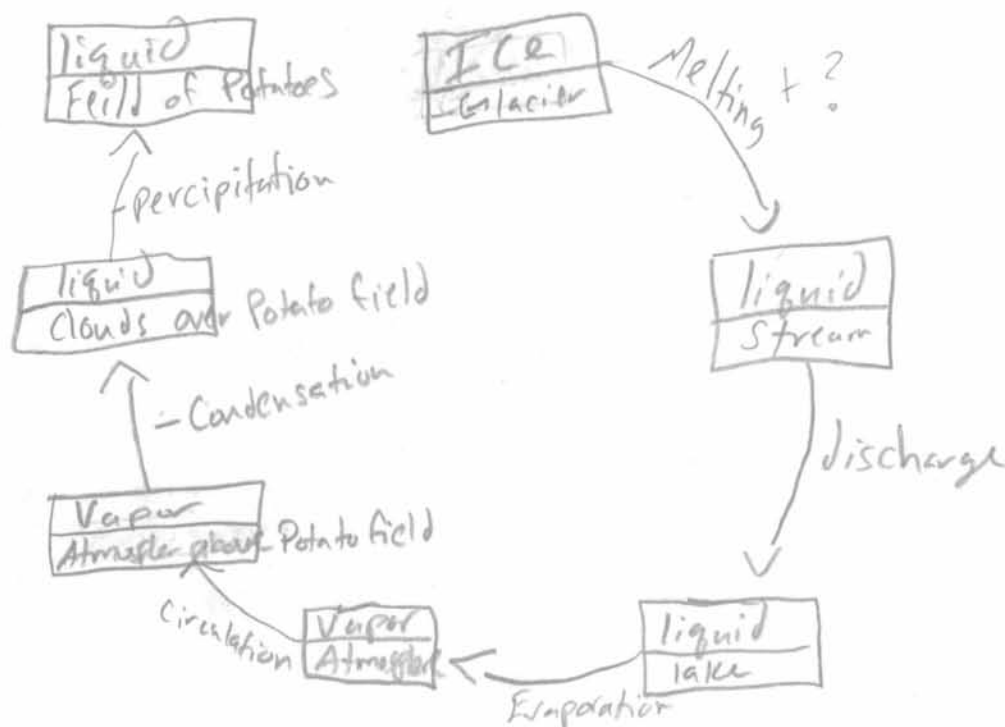


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41107889

SHORT ANSWER. 25 points each (50 points total)

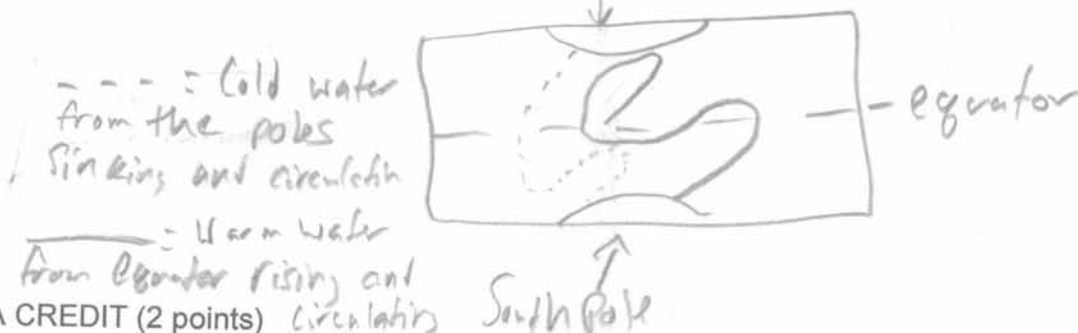
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When solar energy hits the equator it hits it at a more direct angle causing the waters to be warmer than at the poles. Circulation occurs through convection when the warmer water at the equator rises, and the colder water at the poles sinks and circulates the earth. I do not believe there would be much of a change if glaciers became more salty than the surrounding ocean because, the thermohaline circulation has nothing to do with the salt concentration of the water, it deals with the temperature of it.



But how is polar water affected?

EXTRA CREDIT (2 points) How are burning wood and respiration similar?

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- They both convert chemical energy into thermal energy
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40 40

YOUR SCORE:

80

STUDENT ID #: A42833012; GROUP #: N

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

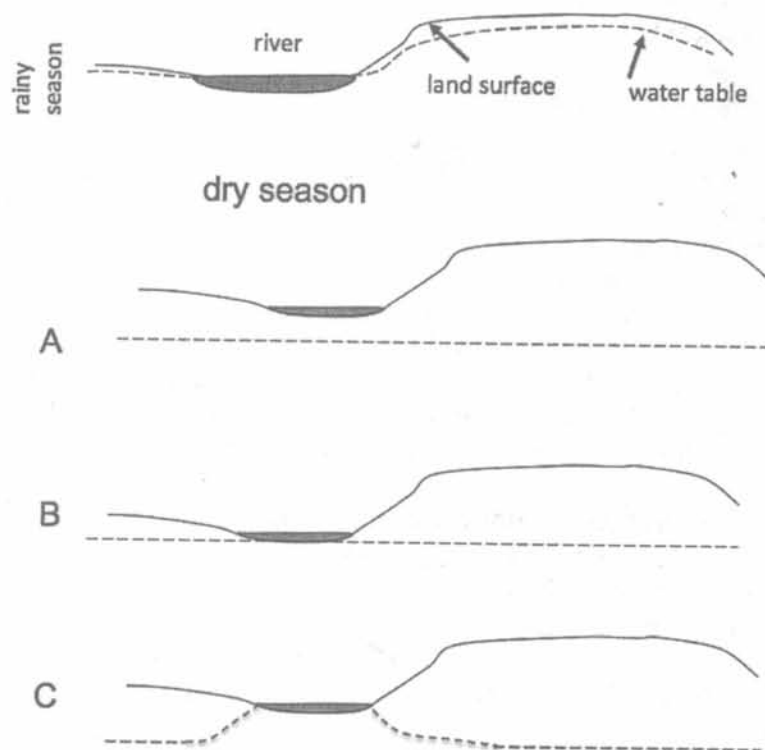
- 8
1. What happens when water molecules condense?
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



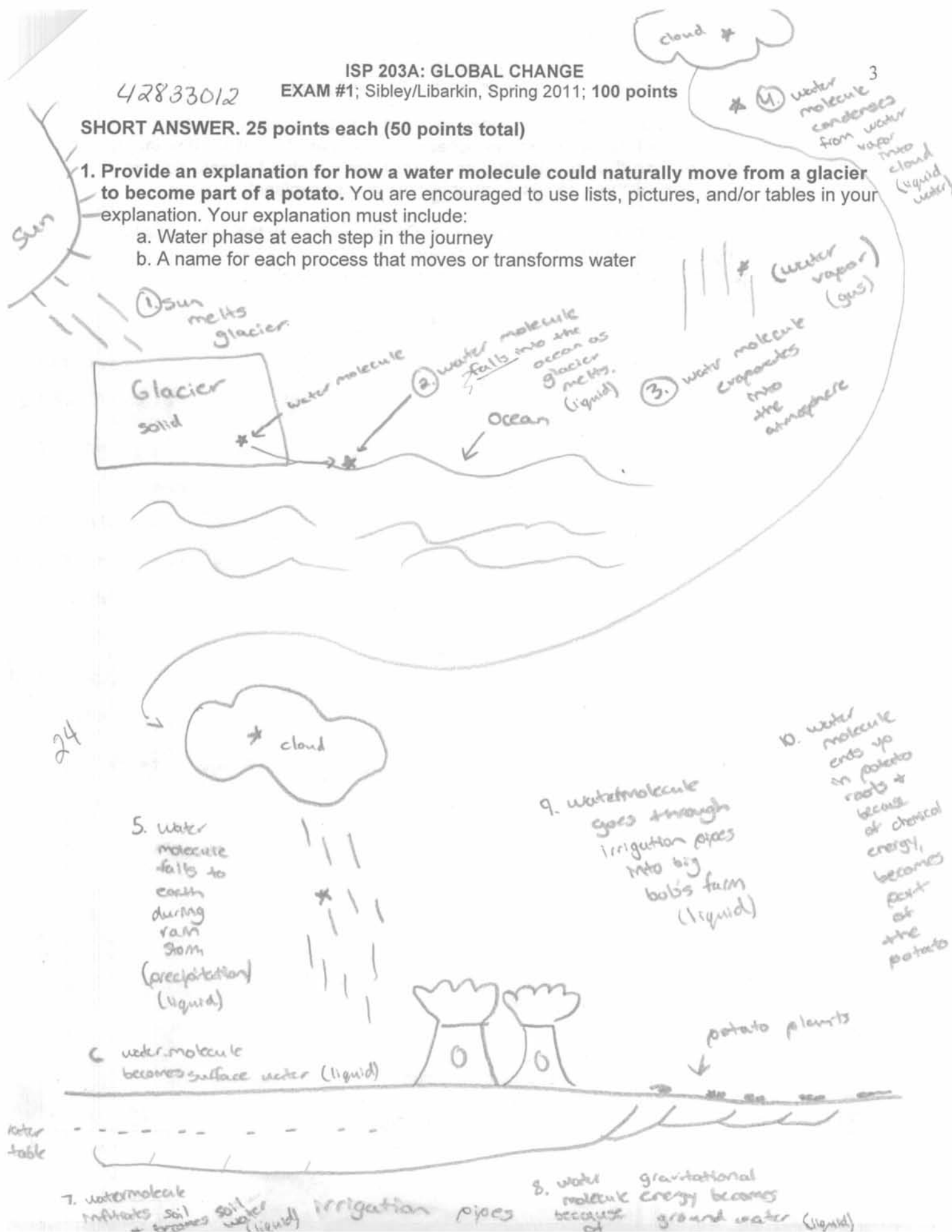
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

42833012

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

As a natural process (thermohaline circulation) in the oceans warmer water circulates towards the equator while cooler water circulates towards the poles because of gravitational pull. If the ice that forms from seawater contained more salt than the surrounding sea water it would become more dense meaning it would sink instead of floating which would push fresher water towards the top of the sea & saltier water (the ice) to the bottom. This would throw off the cycle because the oceans levels would rise & salt consistency levels in the ocean would go down.

20

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- ☒ c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

40 46

YOUR SCORE:

86

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A42609593; GROUP #: N

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense? 9
a. Water molecules become larger
☒ b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
☒ c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
☒ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
a. A= evaporation, B= deposition, C= sublimation
☒ b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates
c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

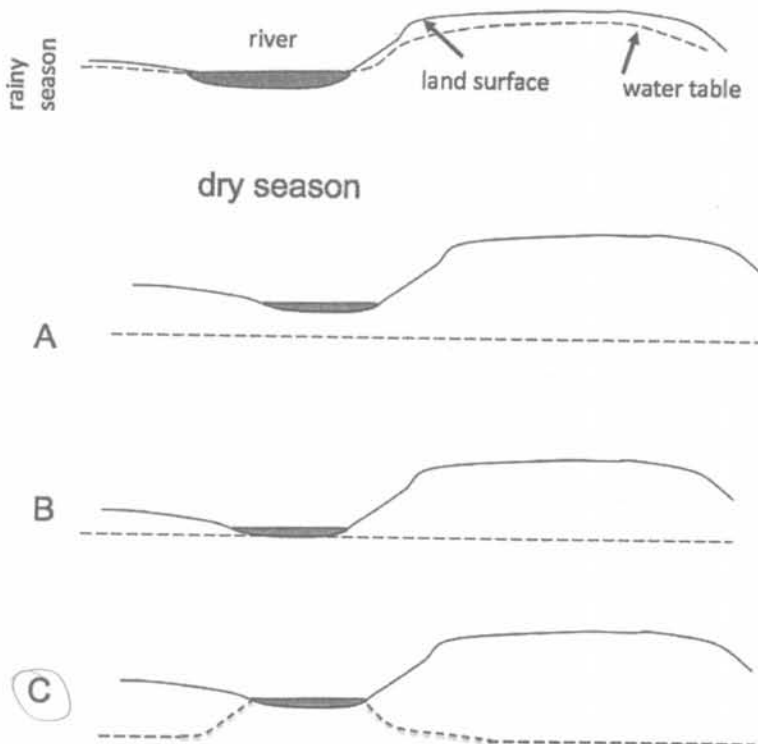
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

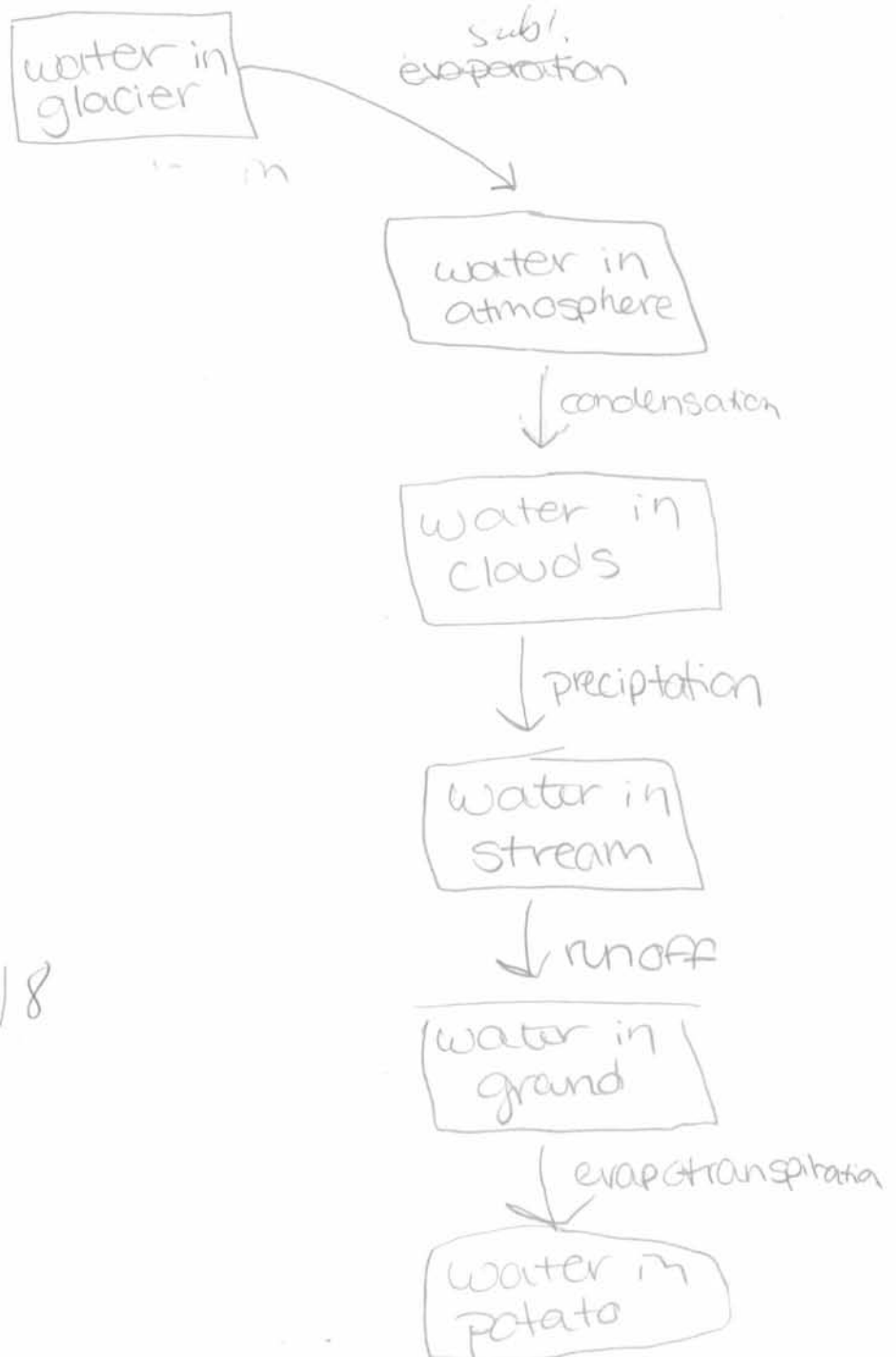


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
b. been less
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

42669593

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

If polar ice contained more salt than the surrounding sea water the process of ice forming would be affected. Fresh water is ~~less~~ less dense than the salt water. Thermohaline circulation depends on thermal energy because warmer water is less dense and cooler water is more dense and sinks. These processes of thermohaline circulation would speed up if the polar ice contained more salt water because that water is more dense and would sink.

10

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

YOUR SCORE:

75

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43643320; GROUP #: 0

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

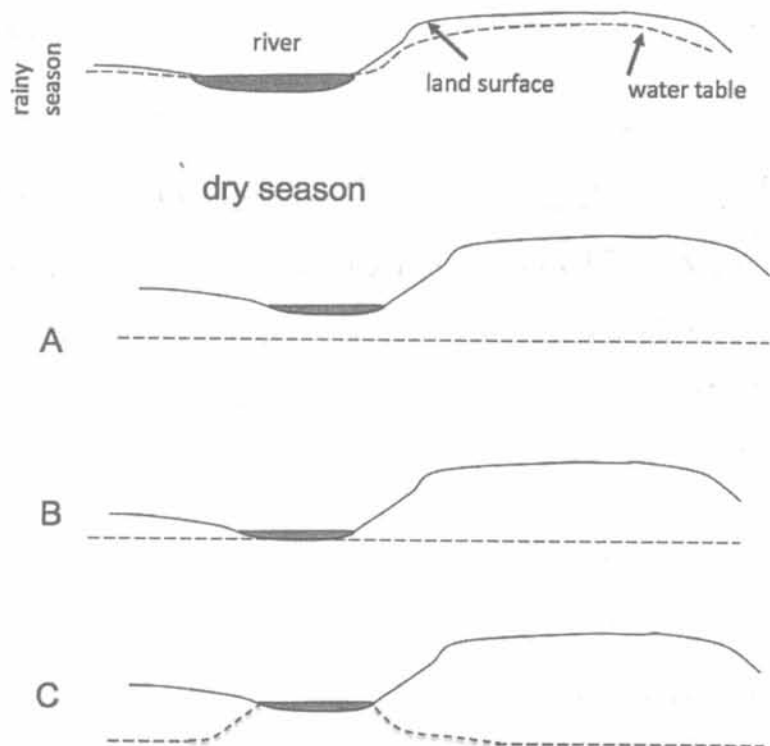
1. What happens when water molecules condense? 6
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
 - ☒ b. Seasonal high water from the Mississippi River
 - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of condensation A , then becomes water in a glacier through the process of B , and then becomes water in clouds through the process of precipitation C .
 - a. A= evaporation, B= deposition, C= sublimation
 - b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
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- c. A = gravitational, B= thermal, C= thermal
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

43643320

SHORT ANSWER. 25 points each (50 points total)

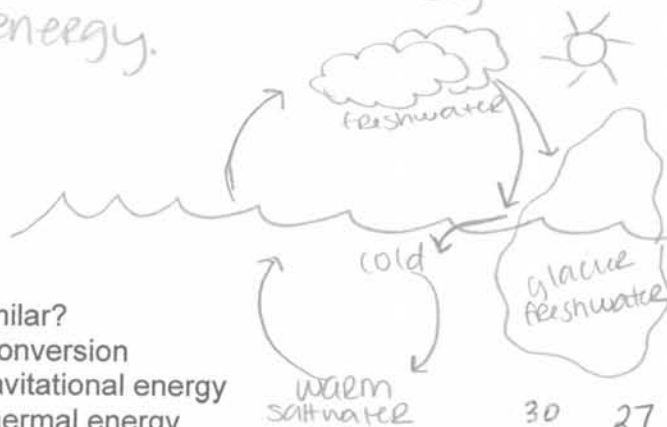
1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water

Water from the glacier melts & runoff into a stream where it is then carried by gravitational energy to the ocean. The water then evaporates into the atmosphere using thermal energy where it then condenses using condensation, into a cloud. The water then precipitates back to earth using precipitation ^{gravitational energy} & then uses infiltration to absorb into the earth's soil. The potato plant's ^{roots} within the soil then absorb that water during photosynthesis & that water then becomes part of the potato & cycle of photosynthesis.

20

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
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Thermohaline circulation would change drastically because the polar ice would become more dense thus making it less buoyant on the water of the ocean. This would then lower the water temperature which would cause the normal circulation of warm & cold water to change. The circulation that normally takes place happens because warm water rises to the surface while cold water falls in order to be warmed by the earth's convection currents. The warm water then evaporates into the atmosphere, condenses & is then precipitated back to the ocean where it will circulate again. The circulation cycle is driven by gravitational & thermal energy.



- 2 EXTRA CREDIT (2 points)
- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

YOUR SCORE:

57

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A41262816; GROUP #: 0

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

5

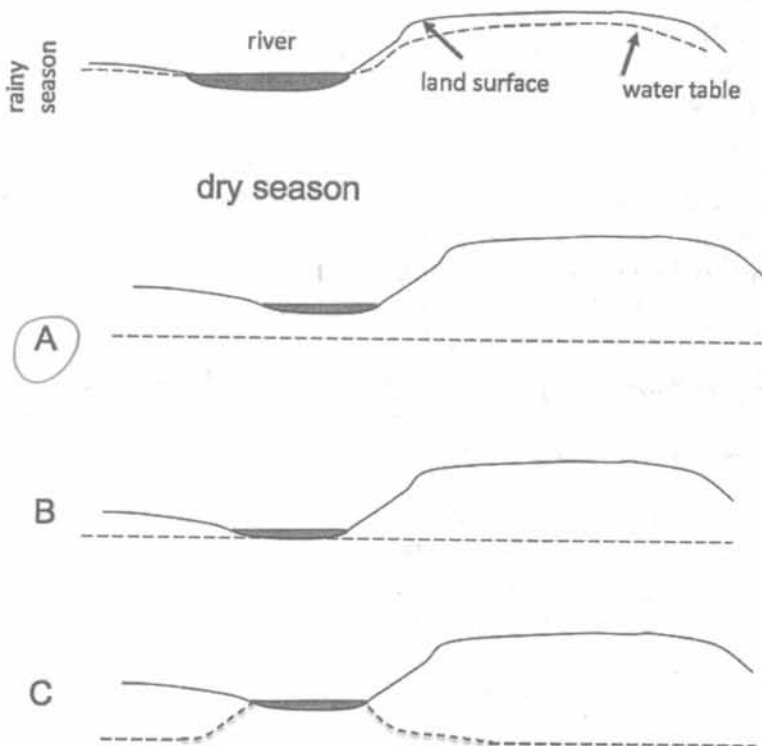
1. What happens when water molecules condense?
 - a. Water molecules become larger
 - ☒ b. Gaseous water becomes liquid water
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 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - ☒ c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
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 - ☒ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
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 - b. A = condensation, B= precipitation, C= evaporation
 - ☒ c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of ____A____ energy. Water in the atmosphere becomes water in clouds as a result of ____B____ energy. Water in clouds becomes water in the atmosphere as the result of ____C____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
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10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- a. Water phase at each step in the journey
- b. A name for each process that moves or transforms water

when the ice melts from the glacier through the process of melting and gravity, then it will go into a large body of water such as the ocean through the process of runoff and recharge. From the ocean it would then be evaporated into the atmosphere where it will stay until thermal energy lets it condense into clouds. As the clouds move all over the world including above a potato farm, it will then precipitate all over the potatoes. Since the potatoes have roots in the ground, the roots would absorb the water and the gravitational pull would recharge the ground-water. After the potato roots absorb the water, it is then part of the potato.

2. When ice forms from seawater, the ice contains less salt than the remaining water.

Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

I don't think the circulation in the oceans would change. Since the glacier would contain more salt it would no longer float, it would sink because it is becoming more dense. Circulation happens because the system is continuously trying to get itself into equilibrium. Heat, temperature, buoyancy and density are the key energy causing the movement and transformation of water. I don't think the glacier would sink to the bottom of the body of water like the rest of the salt water but I do believe if it contained more salt then it would not entirely float like it did when it was less saturated.

5

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

25 27

YOUR SCORE:

52

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A34590917; GROUP #: 0

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

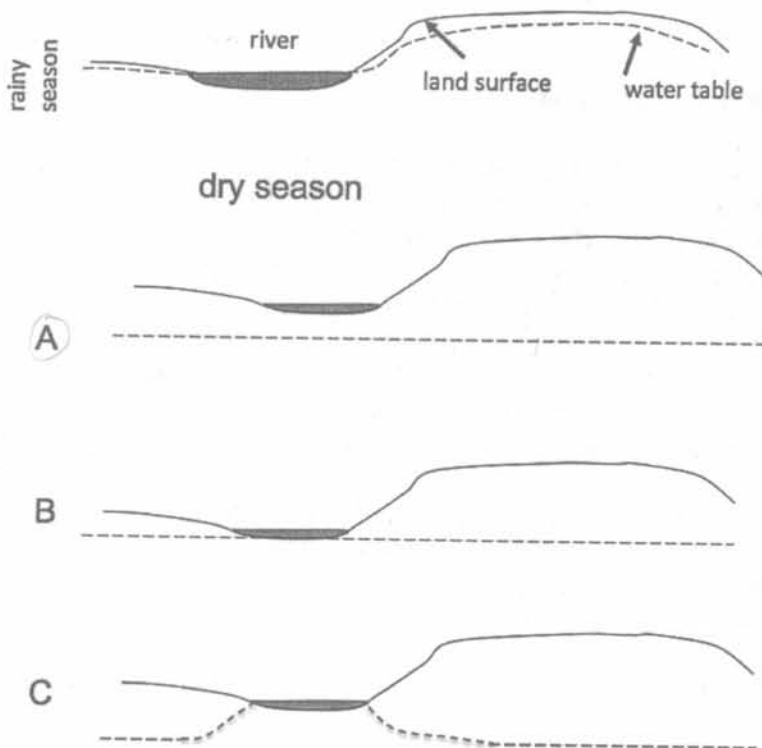
1. What happens when water molecules condense? 4
 - a. Water molecules become larger
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 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir?
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
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 - b. Seasonal high water from the Mississippi River
 - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
 - a. A= evaporation, B= deposition, C= sublimation
 - b. A = condensation, B= precipitation, C= evaporation
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5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
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6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- ☒ b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- ☒ a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - ☒ c. Plants release energy

34590917

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water

Runoff → Evaporation → Condensation → Precipitation → Circulation

When a glacier begins to melt the water from the glacier becomes runoff, the runoff will eventually evaporate into the air and go into the clouds through the process known as condensation. There after the clouds will release water through the process of precipitation. The precipitation / water will then sink into the soil reaching the potato helping to provide the nutrients it needs.



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

If polar ice contained more salt than the surrounding seawater from which it freezes the water would be saltier

Ø

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
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- c. They both convert chemical energy into thermal energy
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20 25

YOUR SCORE:

45

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A41096642; GROUP #: 0

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

8

1. What happens when water molecules condense?
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
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2. Which of the following is the largest freshwater reservoir
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condensation
precip

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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

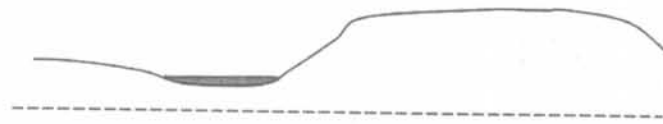
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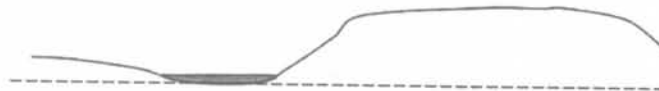


dry season

A



B



C



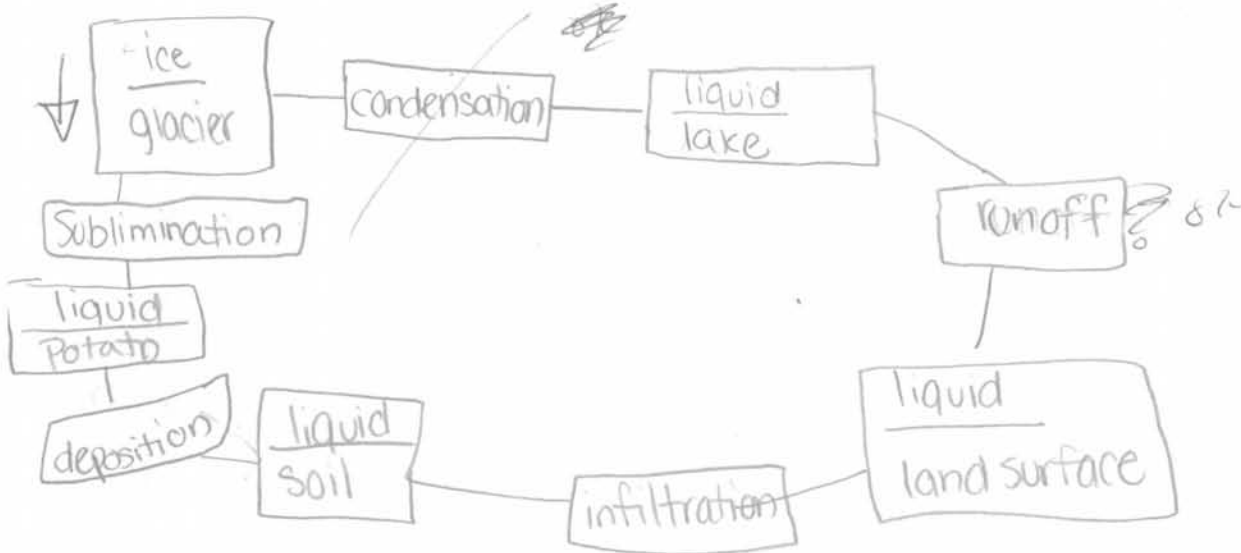
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- a. Plants convert biomass into energy
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41096642

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
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 - A name for each process that moves or transforms water



terms, + phases.
MIXED UP!

10

2. When ice forms from seawater, the ice contains less salt than the remaining water. ^{ice leaves salt behind.} Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

Thermohaline circulation in oceans would change because less salt would be in the remaining water, therefore making the water fresher. This will lead to warmer water, which will evaporate and leave cooler water behind. This happens because warmer molecules are less dense than cooler ones and salty water is more dense than fresh water. Since the polar ice would contain more salt, it would be more dense. The energy that transfers warm molecules to the atmosphere is thermal kinetic. Water also freezes due to thermal kinetic energy. Saltier water would be more dense and lower than fresh water because of gravitational energy. Chemical energy is also used to form the ice.

5

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - ☒ c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

40 17

YOUR SCORE:

57

STUDENT ID #: A39800329; GROUP #: P

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

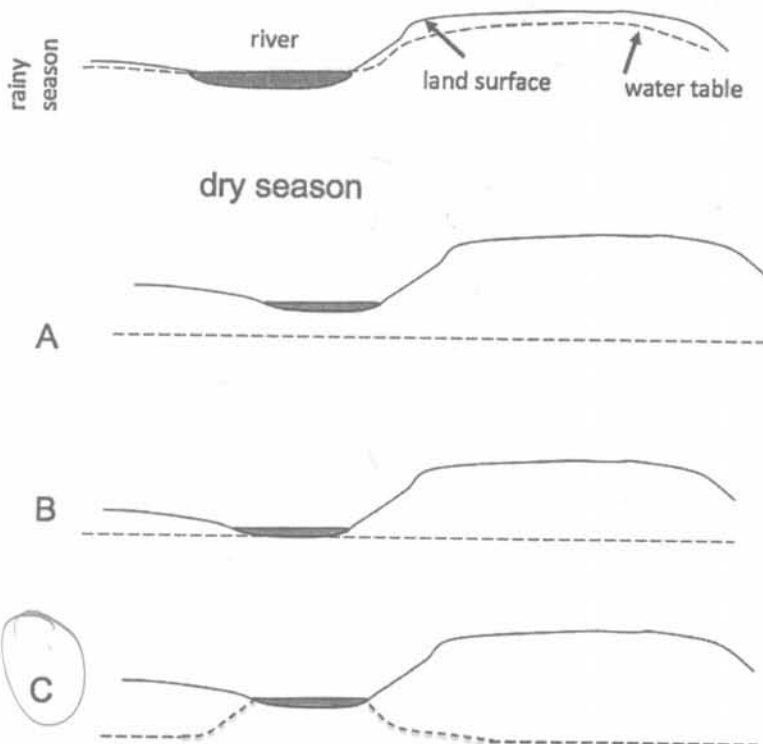
5

1. What happens when water molecules condense?
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
 - ☒ c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - ☒ c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
 - ☒ b. Seasonal high water from the Mississippi River
 - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
 - a. A= evaporation, B= deposition, C= sublimation
 - ☒ b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
 - a. Liquid water from the pot condenses
 - b. Liquid water from the pot evaporates
 - ☒ c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - ☒ b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
 b. A = gravitational, B= gravitational, C= thermal
 c. A = gravitational, B= thermal, C= thermal
 d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



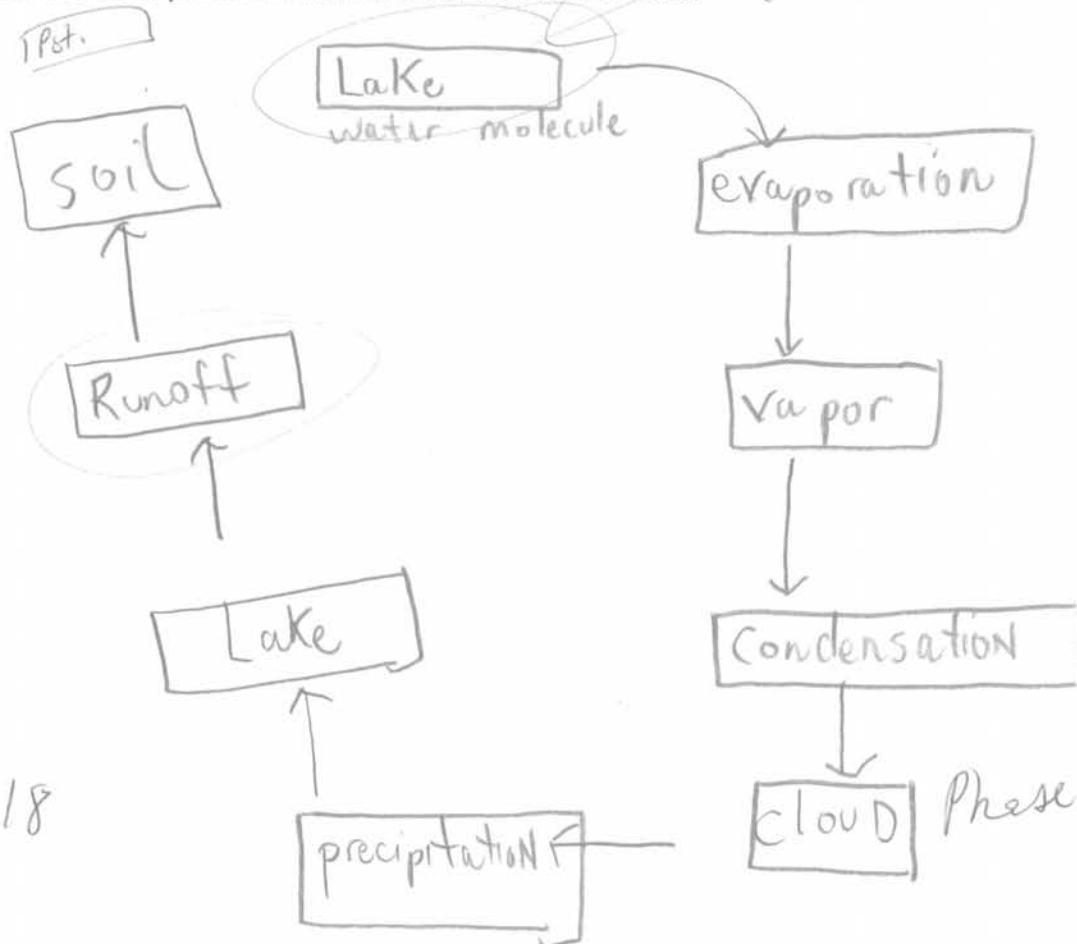
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- been greater
 - been less
 - remained the same
10. What happens when plants respire?
- Plants convert biomass into energy
 - Plants convert energy into biomass
 - Plants release energy

39800329

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



18

The Water molecule from the lake is evaporated and from the atmosphere, becomes water in a cloud through condensation. Then, the water becomes water in a glacier through precipitation. Eventually, the water from the lake runoff into the soil.

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

(If polar ice contained more salt than surrounding seawaters, this could have an effect on glaciers. If the glaciers carried less water, the residence rate would be affected, which could make water travel faster through the water cycle.

2

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

22 25

YOUR SCORE:

47

STUDENT ID #: A40543777; GROUP #: P

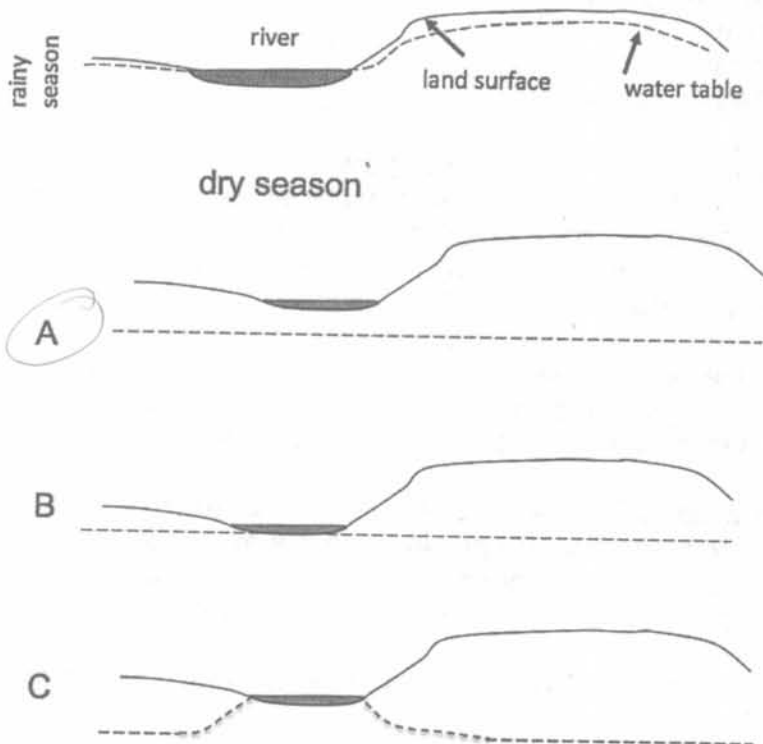
MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- 5
1. What happens when water molecules condense?
☒ a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
☒ c. Glaciers
d. Lakes and streams
 3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
☒ a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
 4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
a. A= evaporation, B= deposition, C= sublimation
b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
☒ d. A = precipitation, B= freezing, C= condensation
 5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates
☒ c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates
 6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
☒ a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
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7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

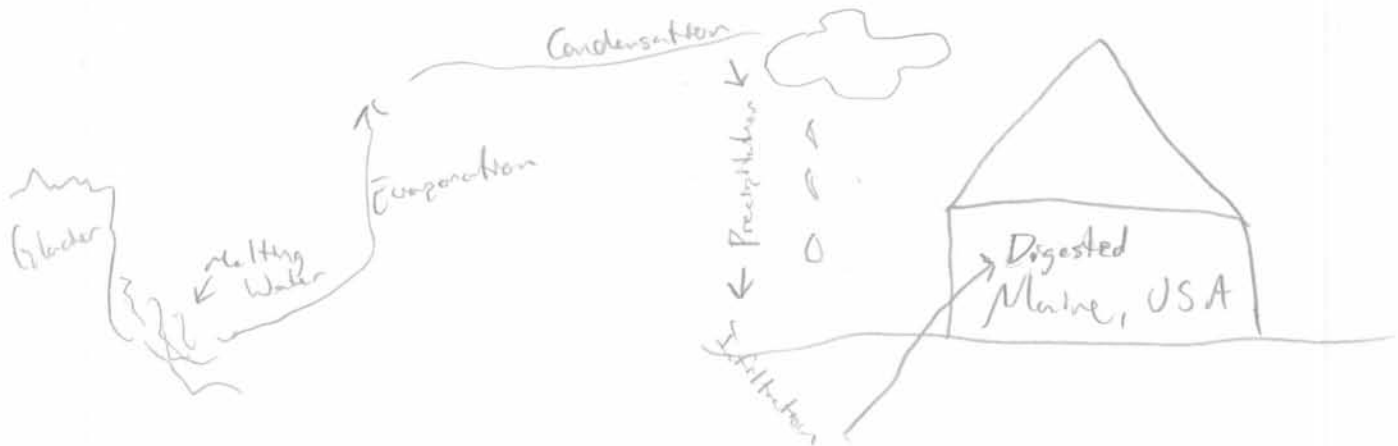
40543777

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water

The glacier would melt, that molecule would evaporate into the air and would travel from North of Greenland to Maine, USA. It would condensate with other molecules and eventually fall as precipitation. The molecule would then INFILTRATE the ground and the roots of said Potato would absorb our friend, the Molecule.



20

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

The circulation would be reduced due to the decreased sea water salinity. If the ice had more salt, the ocean simply has less to circulate. The energy that drives these forces are thermal and kinetic energies.

2

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

YOUR SCORE:

49

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43143418; GROUP #: Q

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

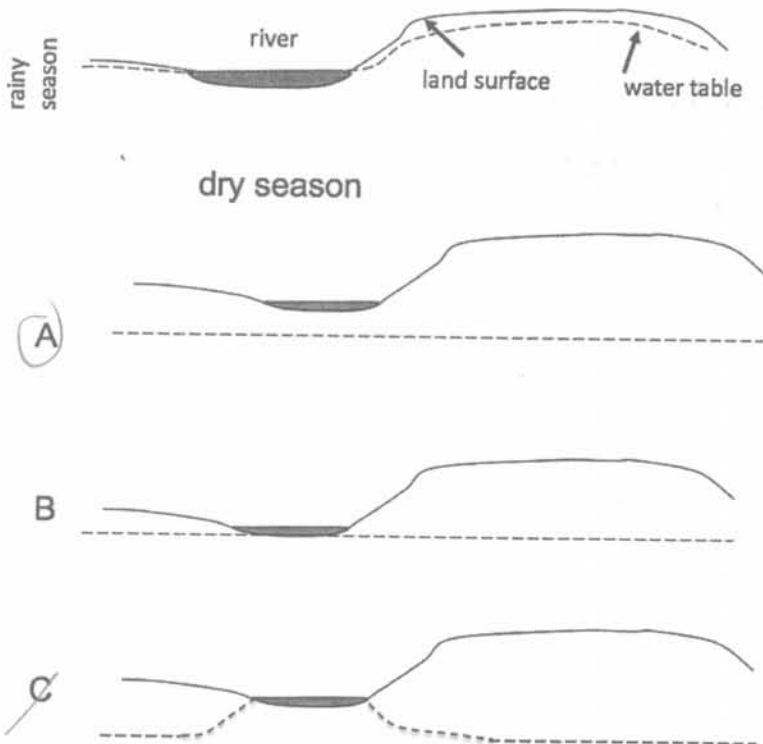
1. What happens when water molecules condense? 6
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
☒ d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
☒ c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
☒ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
☒ a. A= evaporation, B= deposition, C= sublimation
b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
☒ a. Liquid water from the pot condenses
~~b. Liquid water from the pot evaporates~~
c. Water vapor from the pot condenses
~~d. Water vapor from the pot evaporates~~
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
☒ a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- ☒ c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

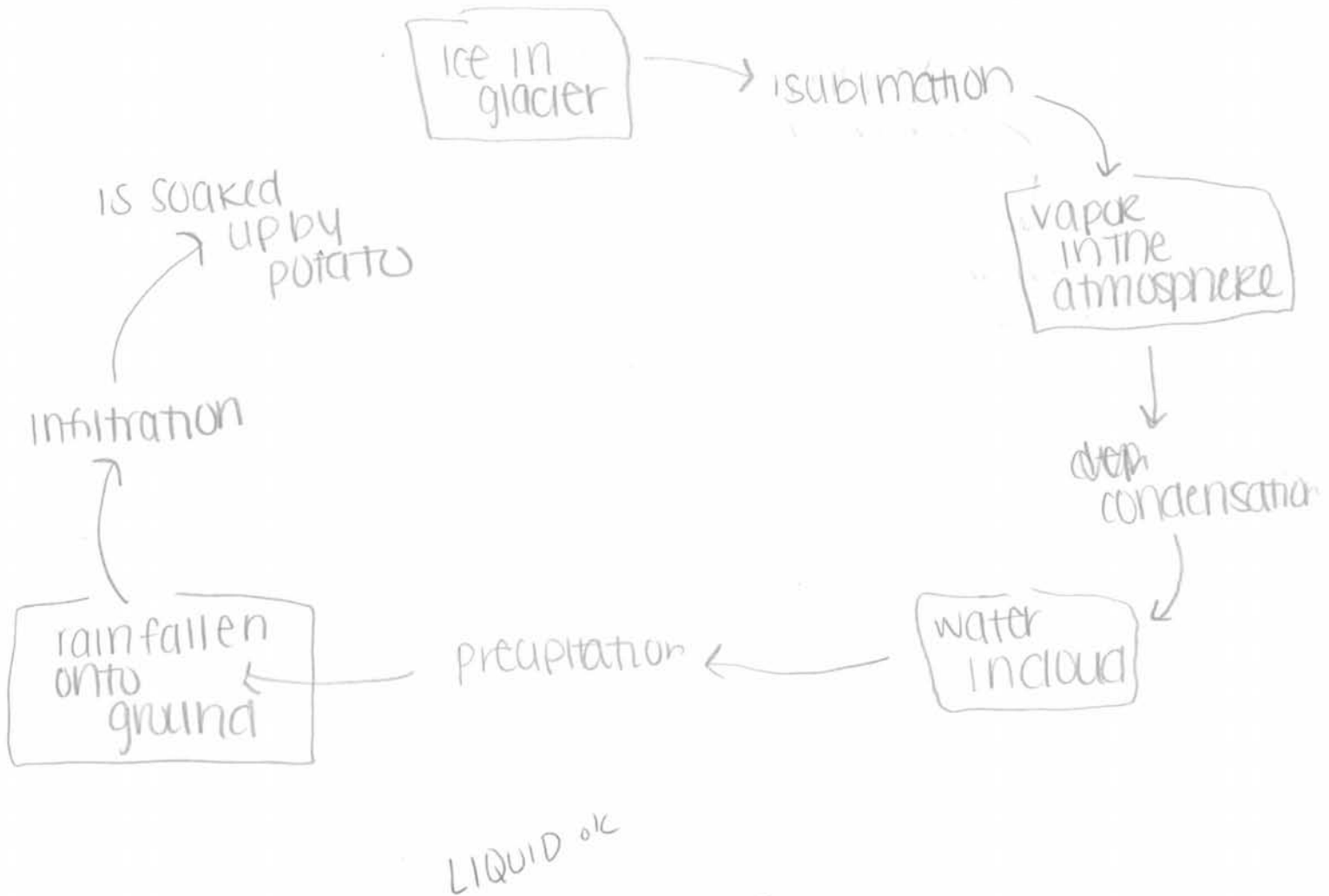


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- ☒ a. been greater
 - ☐ b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - ☒ c. Plants release energy

43143418

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water



25

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

The thermohaline circulation happens when water is warmed near the equator (due to the more direct rays of sunlight on the ocean). The warm water is then carried by currents towards the N/S poles. If the glaciers contained more salt than the surrounding sea water, if ~~the~~ and when they melted, the ocean's salinity would thus increase. When there is more salt in a body of water, it becomes warmer at a faster pace, which in turn would increase the temperature of the water in that area of the ocean. The energy that is causing the movement of the water is gravitational potential. Gravity is moving the water away from the equator and toward the north and south poles of the earth.

15

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- ☒ c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

30 42

YOUR SCORE:

72

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43414990; GROUP #: Q

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

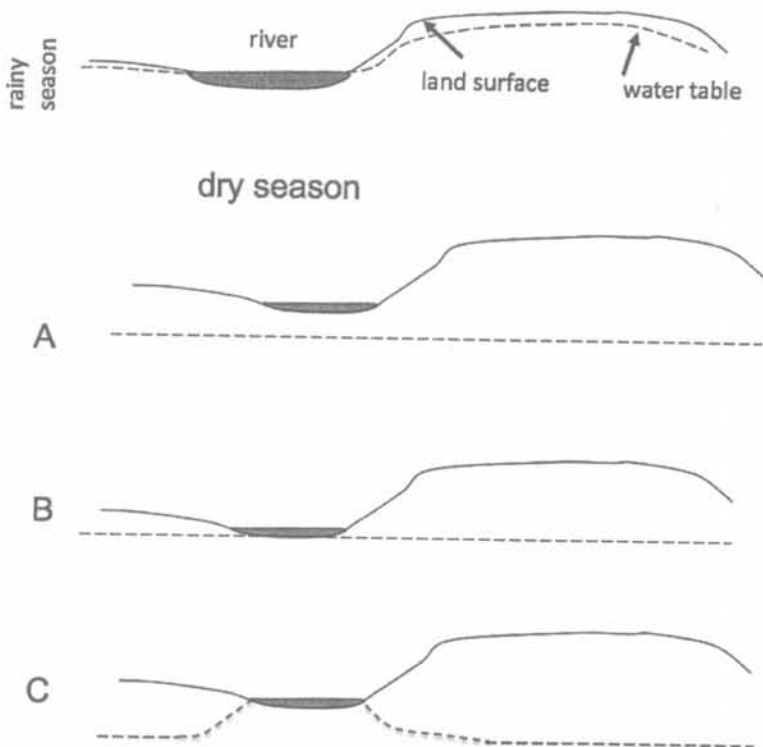
1. What happens when water molecules condense? 6
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
 - b. Seasonal high water from the Mississippi River
 - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
 - a. A= evaporation, B= deposition, C= sublimation
 - b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
 - a. Liquid water from the pot condenses
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 - c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

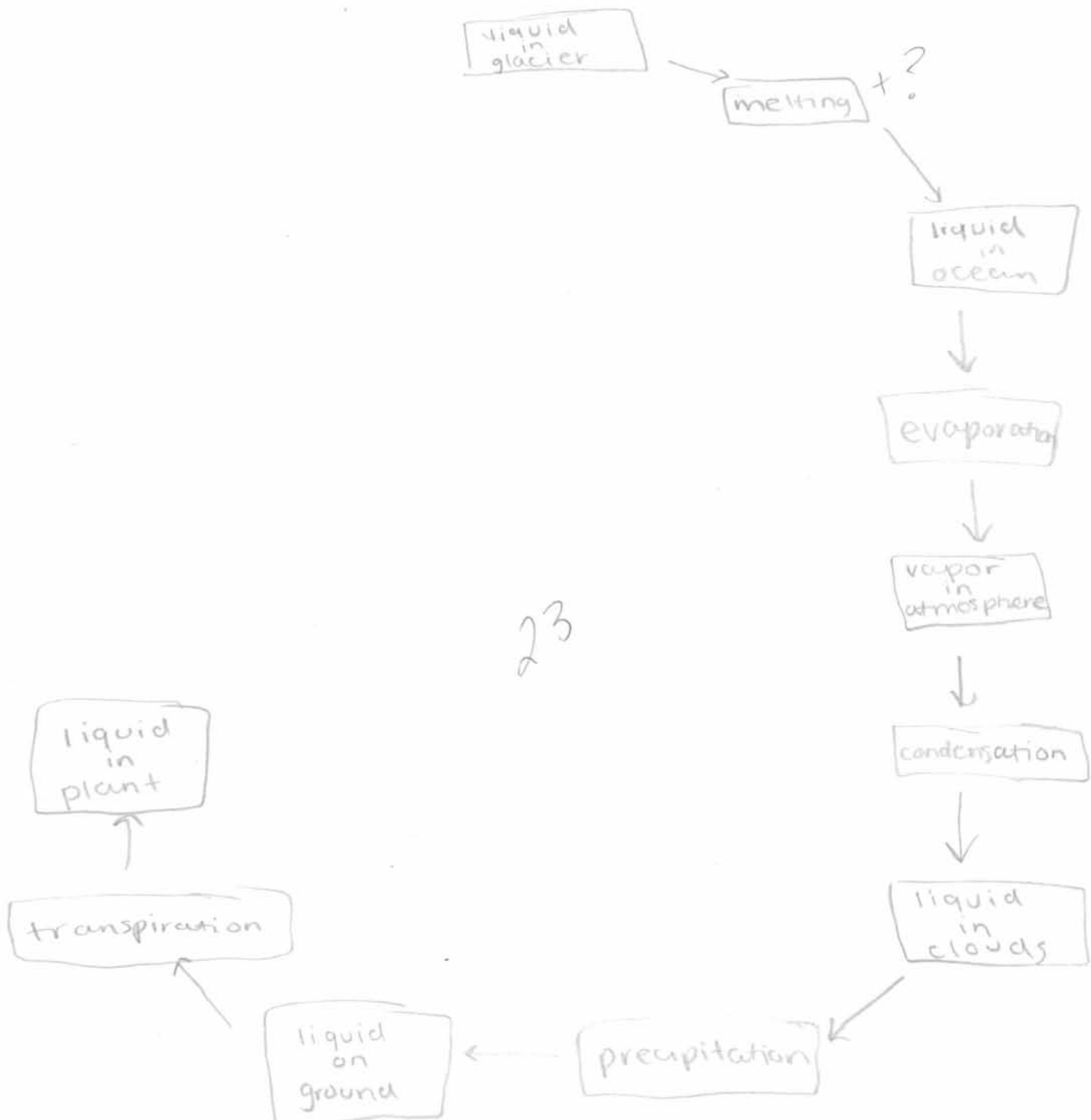


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
b. been less
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

43414990

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

In oceans, freshwater falls to the bottom because it is more dense & seawater rises because it is less dense so when a glacier, that is freshwater, melts it pushes the saltwater down & the cycle starts all over. But if the glacier, or polar ice, contains more salt than it does now there wouldn't be as much circulation, because the salty water that melted contains salt so it is less dense than freshwater & would try to stay at the top of the ocean. The type of energy this is can be related to chemical because you're changing what type of water this polar ice is made up of. But the type of energy that causes the movement is thermal.

5

- 2 EXTRA CREDIT (2 points)
- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - ☒ c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

YOUR SCORE:

60

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43361981; GROUP #: Q

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

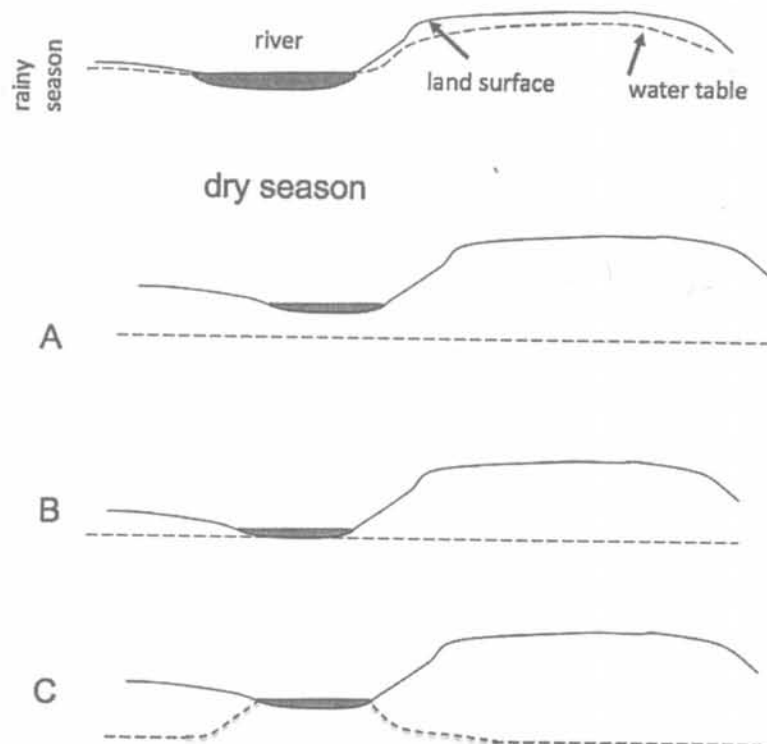
1. What happens when water molecules condense? 9
- Water molecules become larger
 - Gaseous water becomes liquid water
 - Hydrogen and oxygen atoms combine to form liquid water
 - The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
- The atmosphere
 - Oceans
 - Glaciers
 - Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
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4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
- A= evaporation, B= deposition, C= sublimation
 - A = condensation, B= precipitation, C= evaporation
 - A= sublimation, B= precipitation, C= evaporation
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6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



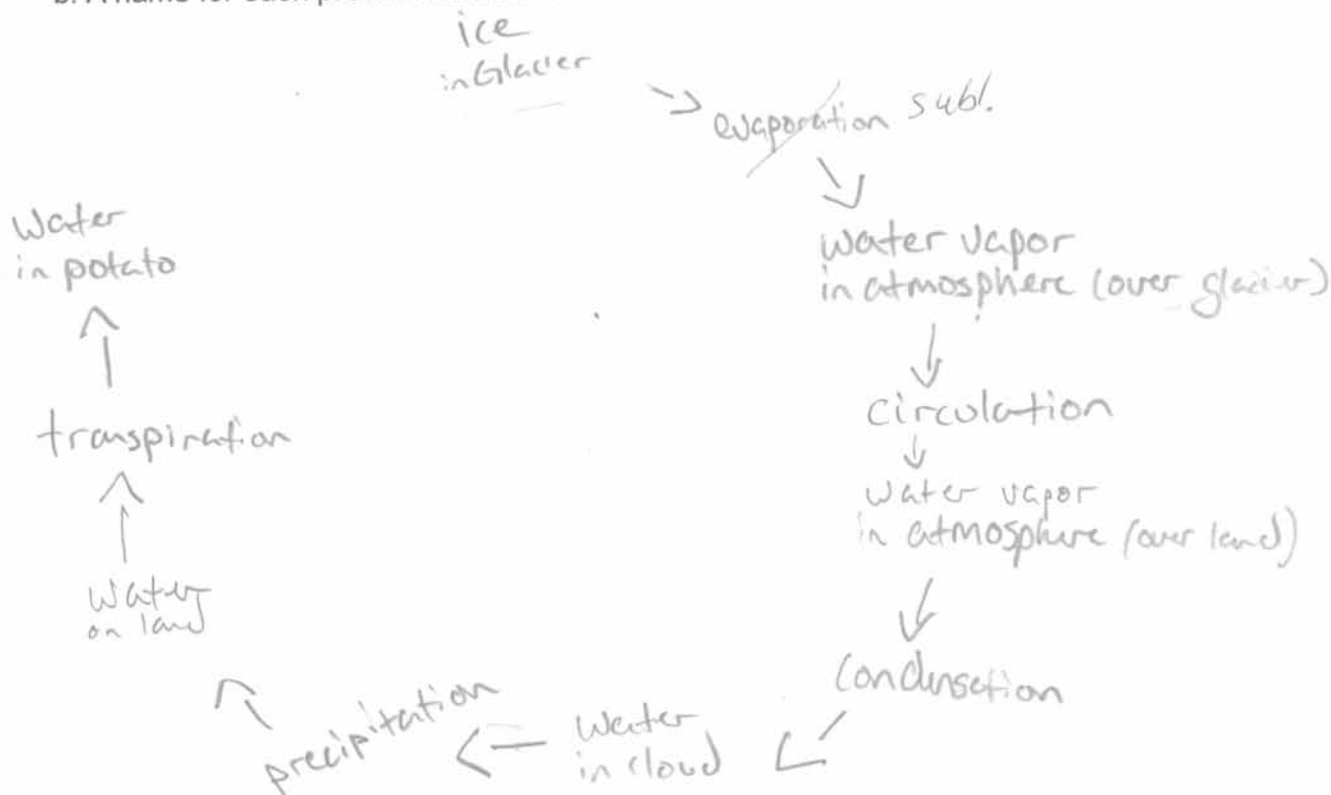
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
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 - ☒ c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
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4336/981

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



Starts off as ice, then evaporates, water vapor circulates around, condenses, the precipitates to the area with the potato and the potato uses the water to grow.

22

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

Circulation happens because seawater is more dense than freshwater causing it to sink. The major factor is wind which causes wind tide circulating the water causing the water to circulate. Using thermohaline circulation, the cold saltwater (coming from the saltwater glacier) would use gravitational energy to sink because it is more dense than the water around it. This would change the circulation because usually the water would stay at the surface because freshwater is ~~more~~ less dense than saltwater.

10

EXTRA CREDIT (2 points)

2 EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

45 34

YOUR SCORE:

79

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43628397; GROUP #: Q

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

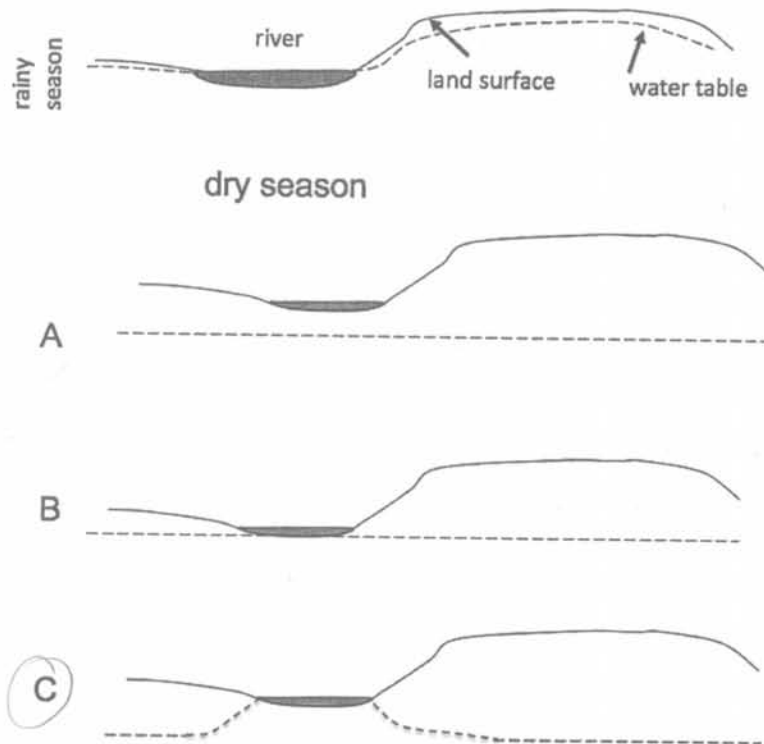
1. What happens when water molecules condense?
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c. Hydrogen and oxygen atoms combine to form liquid water
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ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

43628397

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water

Water molecules would start in the glacier as solid ice. The molecules could become less dense and melt into the ocean water, remaining near the surface as it is fresh water. As part of the ocean, it would evaporate into water vapor as part of the atmosphere and eventually condense into ^{phase?} clouds. The water would fall to earth during precipitation as rain and go into the soil, to the land where the potatoes are growing.



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

If polar ice contained more salt than surrounding seawater, the overall salinity of the oceans would be much greater?

Normally in thermohaline circulation, fresh water is above salt water in the ocean. This is because fresh water is less dense because it has no salt. The fresh water stays on top until it becomes colder and more dense and sinks lower near the salt water. If polar ice had a greater salinity, it would become all messed up, because the recently melted ice would be on top, sandwiching the fresh water already there between two layers of salt water.

normal → fresh water
salt water

5

salt water
fresh water
salt water

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

30 29

YOUR SCORE:

59

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A39979826; GROUP #: R

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense? 3
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
☒ d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
☒ a. The atmosphere
b. Oceans
c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
☒ a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
a. A= evaporation, B= deposition, C= sublimation
☒ b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates
c. Water vapor from the pot condenses
☒ d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
☒ c. Predictions about global warming do not address global precipitation.

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

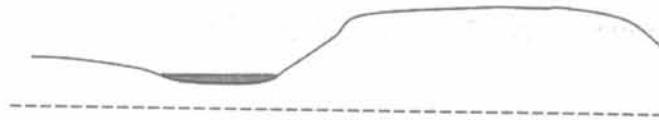
- a. A= chemical, B= thermal, C= thermal
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c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

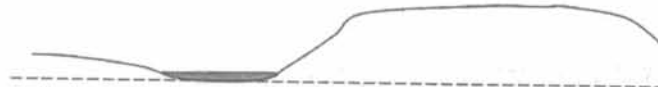


dry season

A



B



C



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
b. been less
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

39979826

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water

A water molecule could naturally move from a glacier to become part of a potato through the water cycle. First overtime the glacier could melt giving liquid water to the water source the glacier is in. Then the water would evaporate into the atmosphere. Then the water vapor would condense & form a cloud. Then precipitation occurs ^{Pres?} & liquid water would go back to the earth's surface. The liquid water would then be absorbed into the earth's ground water which would then become part of the potato.

~~20~~ 20

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

Thermohaline circulation in oceans could change if polar ice contained more salt than the surrounding seawater from which it freezes because more salt would create more thermohaline circulation. This would occur because salt in the water causes an increase in thermal energy which in turn creates an increase in circulation. We know this because ice has less salt than in the water surrounding it because that is the only way it will be able to freeze. Therefore, it isn't possible for the glaciers to contain more salt because they aren't able to freeze as well leaving us without any glaciers.

5

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

15 27

YOUR SCORE:

42

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

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5

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

15 27

YOUR SCORE:

42

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A40688630; GROUP #: R

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer. 7

1. What happens when water molecules condense? *TEMP ↓ ↑condense ↓density*
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
vapor in atmosphere → liquid incl. cloud
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
liquid cloud
liquid atmosphere
a. A = evaporation, B = deposition, C = sublimation
b. A = condensation, B = precipitation, C = evaporation
c. A = sublimation, B = precipitation, C = evaporation
d. A = precipitation, B = freezing, C = condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates
c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates
pot air rises
↑temp so ↓condenses
vapor is invisible
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.
global warming
↑droughts
↑floods
↑precip
↑global temp = ↑global warming

A40688630

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

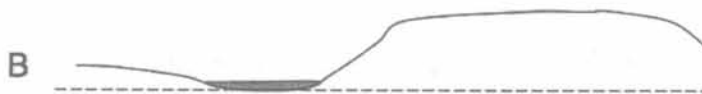
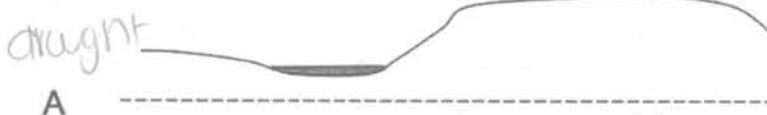
7. Fill in the blanks. Water on the ground becomes water in the soil as a result of gr. A.V. energy. Water in the atmosphere becomes water in clouds as a result of B energy. Water in clouds becomes water in the atmosphere as the result of C energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



dry season



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater
b. been less
c. remained the same

density of ice < density of liquid
IF
density of ice > density of liquid
rise in sea level = 0

10. What happens when plants respire?

- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

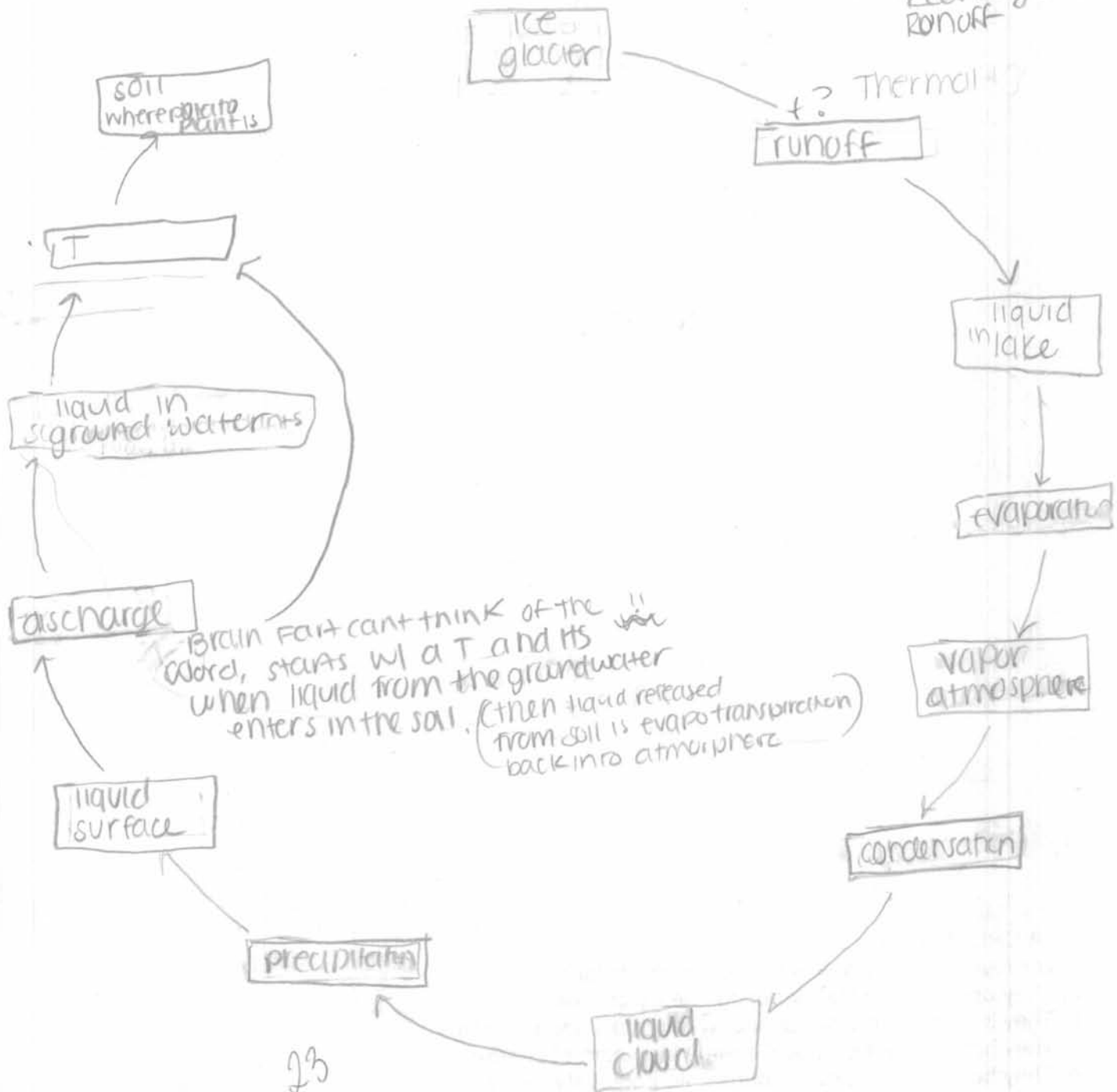
40688630

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



\uparrow dense = \downarrow temp

\downarrow dense = \uparrow temp

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

4

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - The energy that is causing movement or transformation of water.



*The amount of precipitation is \uparrow as well, which \uparrow the water retained.

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

*The polar ice would sink rising water levels, decreasing the reservation time because since density \uparrow the sea cant hold as much so it is being evaporated more quickly and more water is being released into the atmosphere as a result

YOUR SCORE:

35/35

68

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A41548166; GROUP #: _____

5

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
 - ☒ c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - ☒ c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - ☒ a. Rainfall and surface runoff into the lake
 - b. Seasonal high water from the Mississippi River
 - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
 - a. A= evaporation, B= deposition, C= sublimation
 - ☒ b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
 - a. Liquid water from the pot condenses
 - ☒ b. Liquid water from the pot evaporates
 - c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

41548166

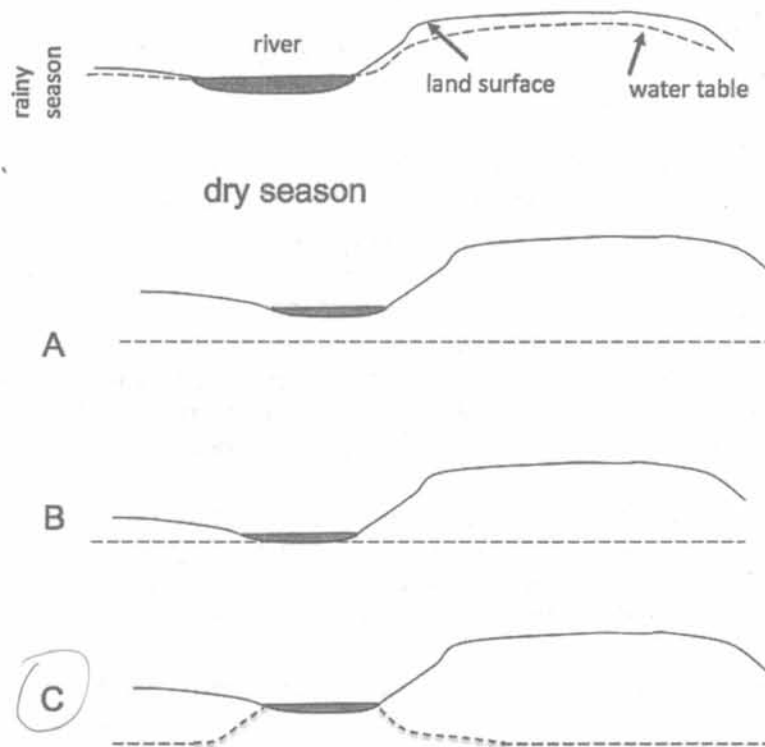
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- ☒ c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- ☒ a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- ☒ a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

41548166

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water

The ice in the glacier [?] moves and produces running water into a stream. The stream then evaporates into the atmosphere and the water vapor in the atmosphere condenses to form clouds. They then form precipitation then rain infiltrates into the ground where the liquid water goes into the potato plant.

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

The pure ice would contain MORE salt
and the seawater which it froze from in
the thermohaline circulation would change.

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

25 17
YOUR SCORE:
42

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A40711436; GROUP #: R

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
☒ d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
☒ b. Oceans
c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
☒ a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
a. A= evaporation, B= deposition, C= sublimation
☒ b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates
☒ c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
☒ a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
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40711436

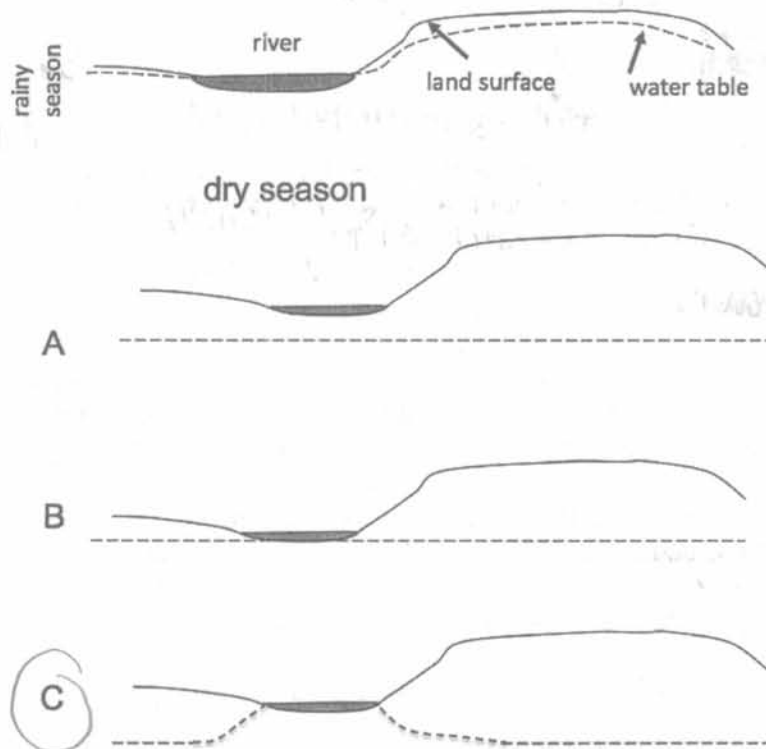
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
b. been less
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

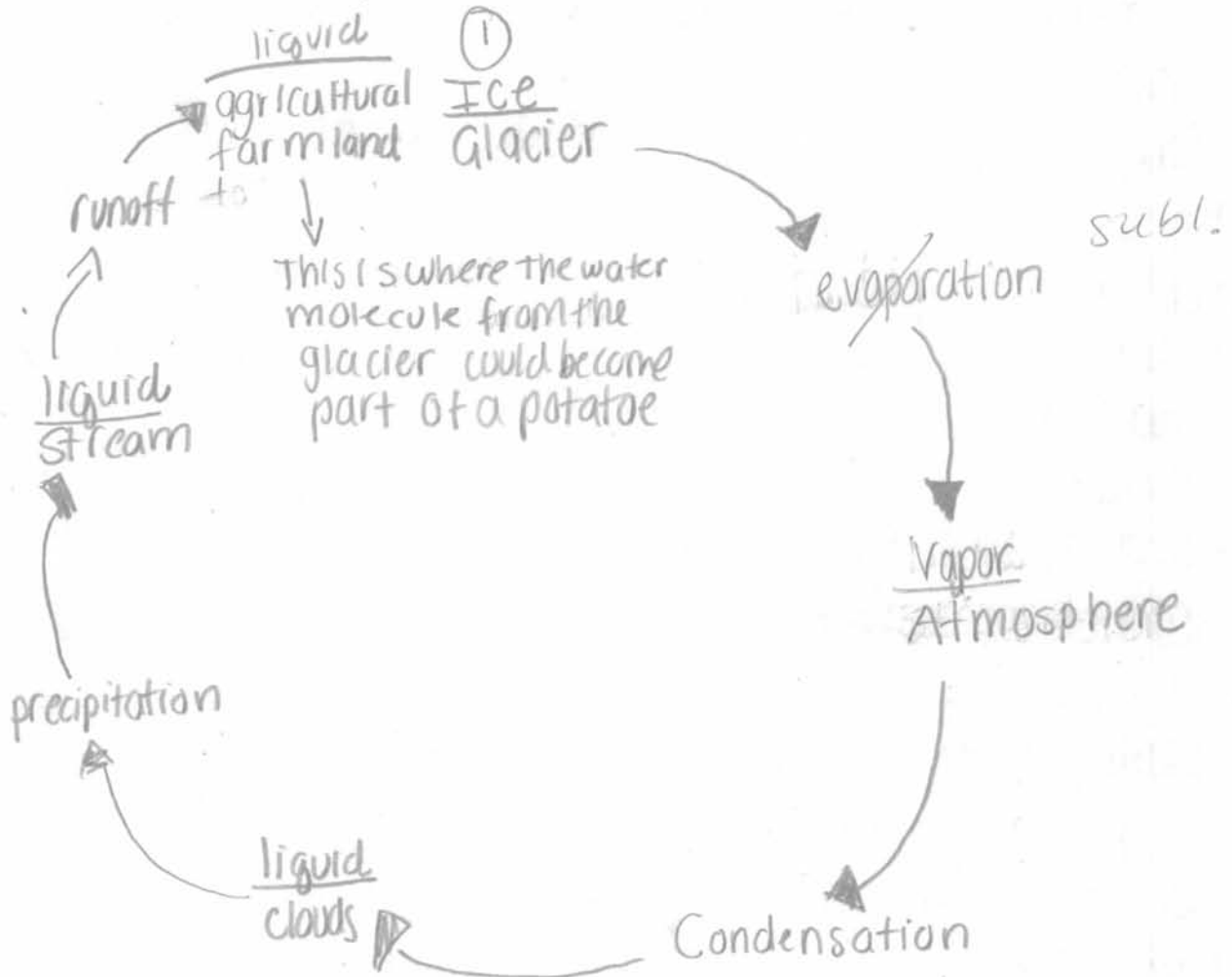
40711436

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



23

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

Thermohaline circulation is causation of wind currents forming wind patterns in the ocean. At lower latitudes the water is warmer, and warmer water rises. At higher latitudes the water is colder, and colder water sinks. The wind currents in the ocean carry warm water to higher latitudes, & the cold water replaces the warm water. Freshwater and saltwater are key components to thermohaline circulation. If polar ice contained more salt water it would decrease thermohaline circulation, in turn causing warm water to move to higher latitudes towards the polar region, the warm water would cease into the colder water, ^{this would} overtime resulting in an increase temperature in ocean water. The energy that is causing movement of water is gravitational potential energy converted to gravitational kinetic energy along with the wind currents forming in the ocean.

18

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

25 23 18

YOUR SCORE:

66

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A40994271; GROUP #: B

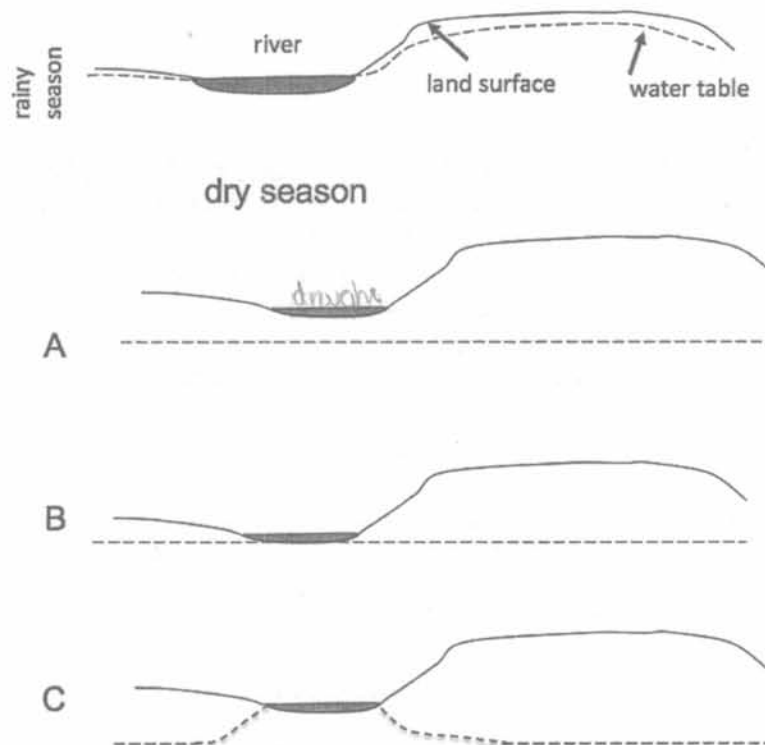
MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
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c. Glaciers
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3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
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4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
a. A= evaporation, B= deposition, C= sublimation
b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
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6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

40994271

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.
- a. A= chemical, B= thermal, C= thermal
 b. A = gravitational, B= gravitational, C= thermal
 c. A = gravitational, B= thermal, C= thermal
 d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 b. been less
 c. remained the same
- ice > water
10. What happens when plants respire?
- a. Plants convert biomass into energy
 b. Plants convert energy into biomass
 c. Plants release energy

40994271

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

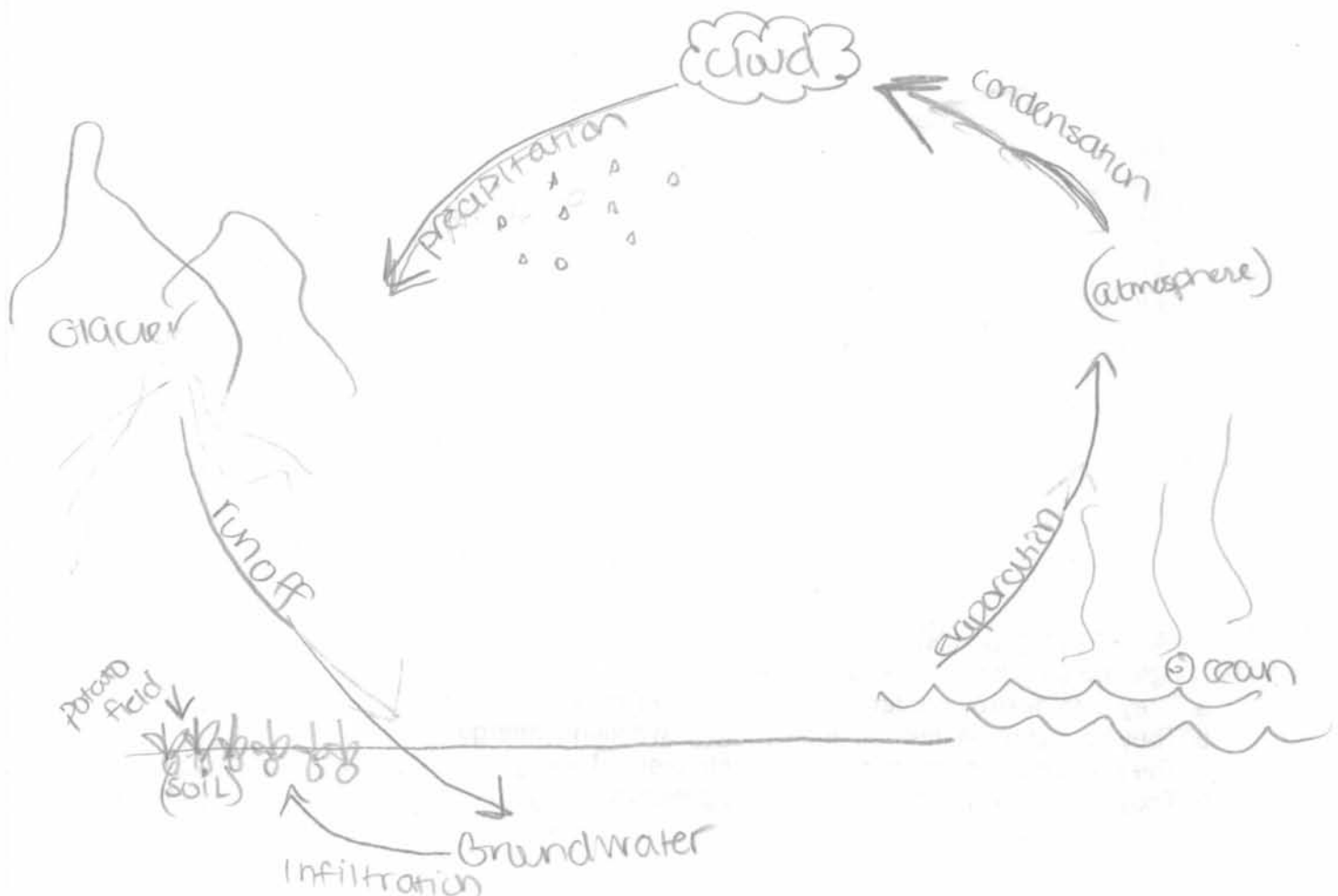
SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water

Basically, glaciers ^{first melt} off into the groundwater ^{infiltr.} than moves up into the soil of where the potatoes are being grown through the process of infiltration.

15



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - The energy that is causing movement or transformation of water.

The way that thermohaline would change if it contained more salt than the surrounding seawater is that it would allow the ice to be less dense and the molecules would condense and sink which causes the sea level to rise. so, if the ice glaciers contained less salt than it would allow them all to sink which throws off the process of circulation in the atmosphere because there will be more ocean water going into the atmosphere through evaporation but when it condenses into clouds the precipitation goes right back into the water. The glaciers can't sink other wise the process will be thrown off.

5



EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

50

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A39127449; GROUP #: 5

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
☒ a. Rainfall and surface runoff into the lake
☐ b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
a. A= evaporation, B= deposition, C= sublimation
b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates
c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

39127449

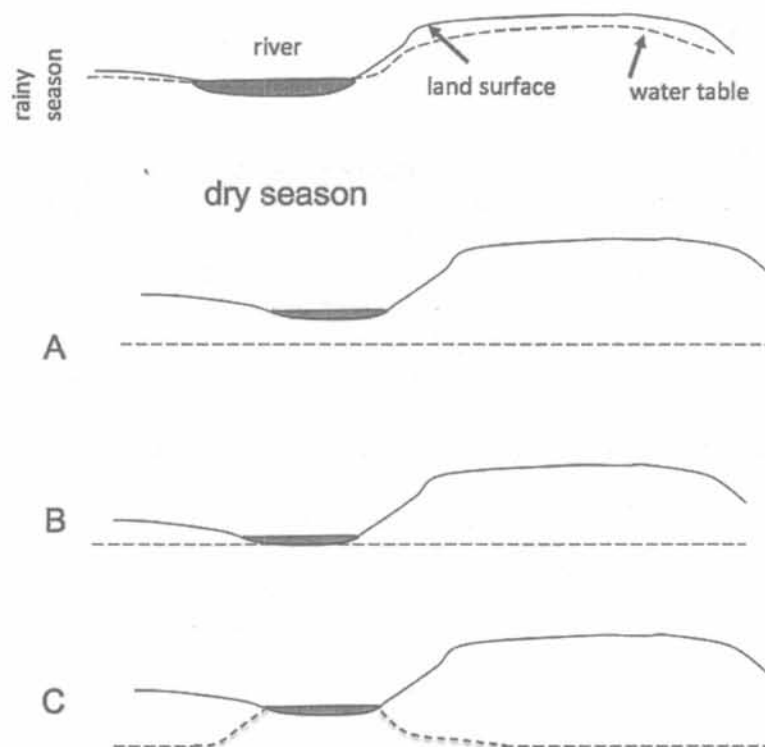
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



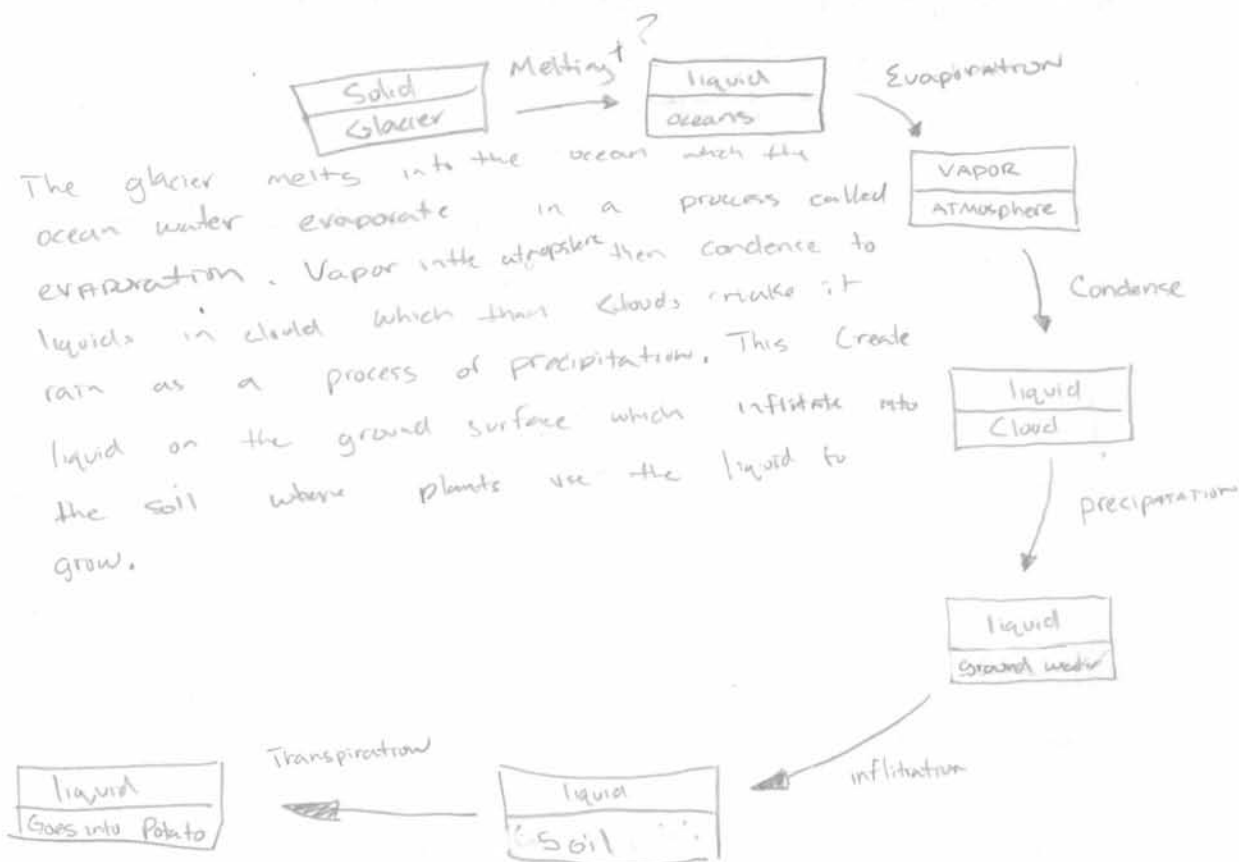
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

39127449

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water



23

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

Circulation happens because warm water is less dense than cold water so it is at the top of the ocean. Cold water is denser so it is at the bottom of the ocean. When fresh water comes from runoff into the ocean it pushes the salt water down because fresh water is less dense than salt water. Eventually the water will mix and become equal. This process that will happen again. The energy that is causing movement or transformation of water is thermal energy to chemical potential energy.

10 If polar ice contained more salt than the surrounding sea water then the ice would sink because it would be more dense because it contains more salt. In my opinion I don't think it would change the thermohaline circulation because the ice would still be in the water and once it melts, if it do, it will eventually melt into the sea, mixing the salt.

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

30 35

YOUR SCORE:

65

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43292970; GROUP #: S

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?
a. Water molecules become larger
☒ b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water ×
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
☒ c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. Rainfall and surface runoff into the lake
☒ b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
a. A= evaporation, B= deposition, C= sublimation
☒ b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates
☒ c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
☒ a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

43292970

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

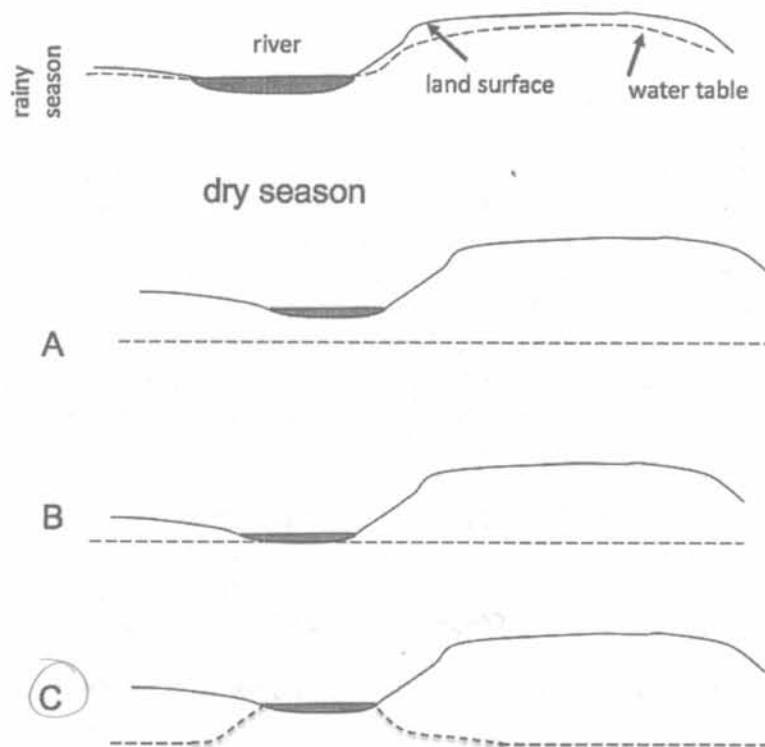
2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

gravitational
thermal
thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

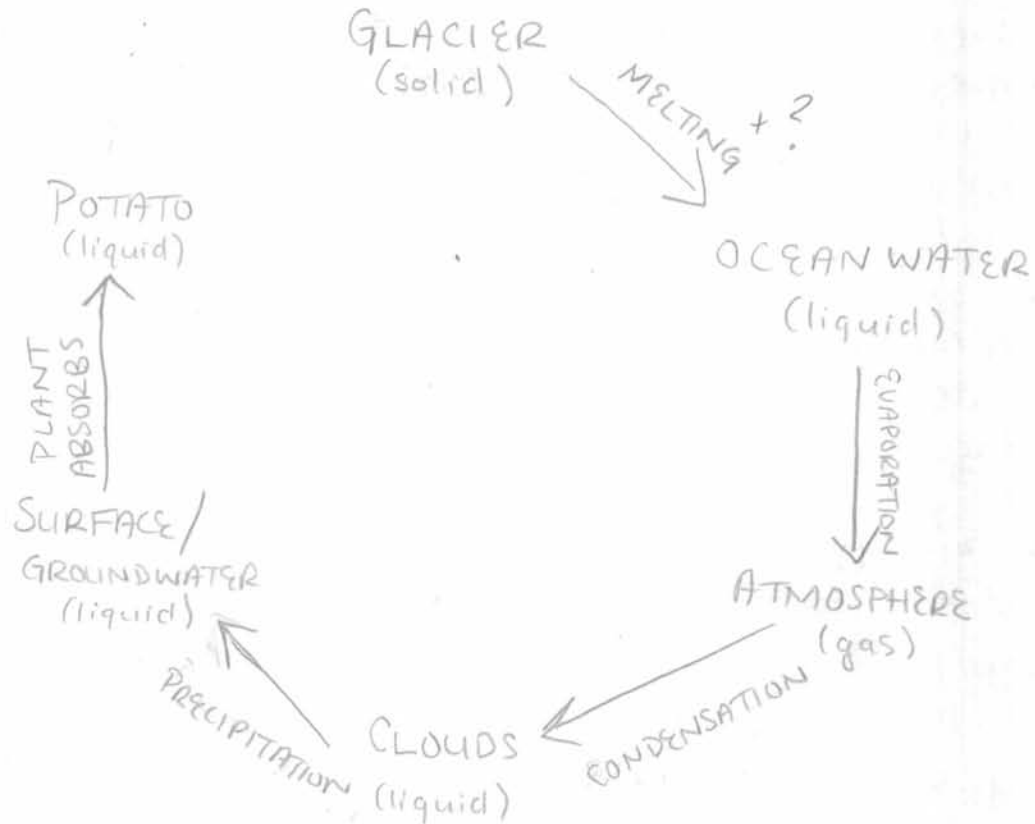


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
b. been less
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

43292970

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water



23

When the water starts out in the glacier, it melts into the ocean changing from a solid to liquid state. From the ocean, the water evaporates into the atmosphere when heated and changes from a liquid to a gas. The water vapor is converted back to a liquid once again when it condenses into a cloud. When the water molecules become heavy enough, they fall to the Earth's surface as precipitation, where it could there possibly infiltrate the soil. Then, a potato plant could potentially suck up the water through its roots and essentially be a part of the plant.

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

First of all, the reason thermohaline water occurs in the oceans is because there are density differences between saltwater/freshwater as well as warm and cool water. Freshwater is less dense than saltwater because it doesn't have all the extra salt taking up space. And warm water is less dense than cold water because the molecules are farther apart from one another. Now what causes the circulation? As freshwater starts to mix in with the saltwater, its density increases because the salt starts to take up space. Then, the density causes it to sink and the process repeats as more freshwater enters the ocean. For warm and cool water, after a while the warm water cools and starts to sink because it's now less dense. This process also repeats.

Now, if ice contained more salt than the surrounding seawater, when it melts, more salt would be located at the top of the water. Not only would the salt levels be higher, but it would also cause the salt circulation to move faster due to it being so dense. This could potentially lead to strong currents. Another possibility is that the extra salt in the ice can cause it to be MORE DENSE than the seawater and the ice could sink, cooling the temperature of all the surrounding seawater.

15

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - ☒ c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

40 40

YOUR SCORE:

80

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43294133; GROUP #: 5

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?
a. Water molecules become larger
☒ b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
☒ b. Oceans
c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. Rainfall and surface runoff into the lake
☒ b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of condensation A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
a. A= evaporation, B= deposition, C= sublimation
☒ b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
☒ a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates → turns into vapor
c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
☒ a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

43294133

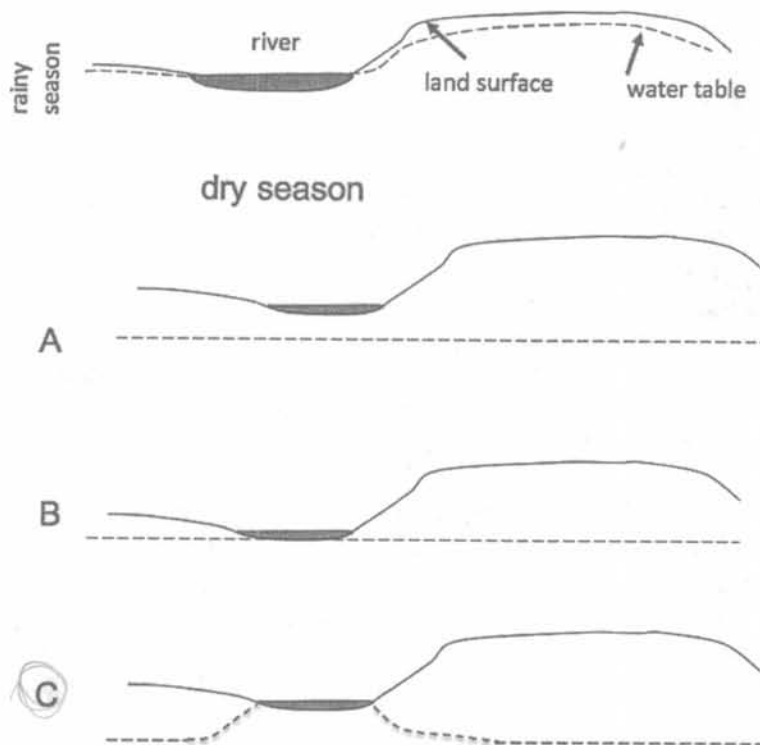
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of gravitational A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater
b. been less
c. remained the same

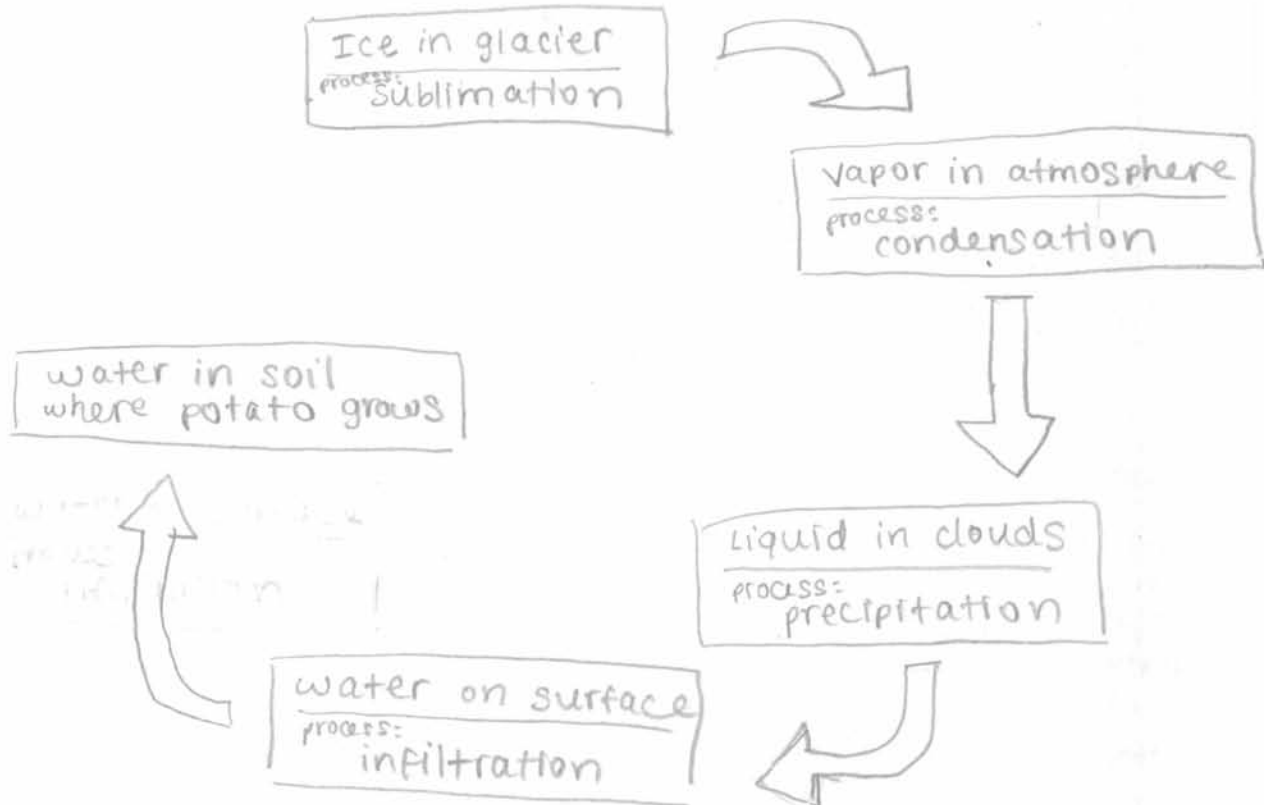
ice would sink = ↑ sea level?

10. What happens when plants respire?
a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

41
4329033

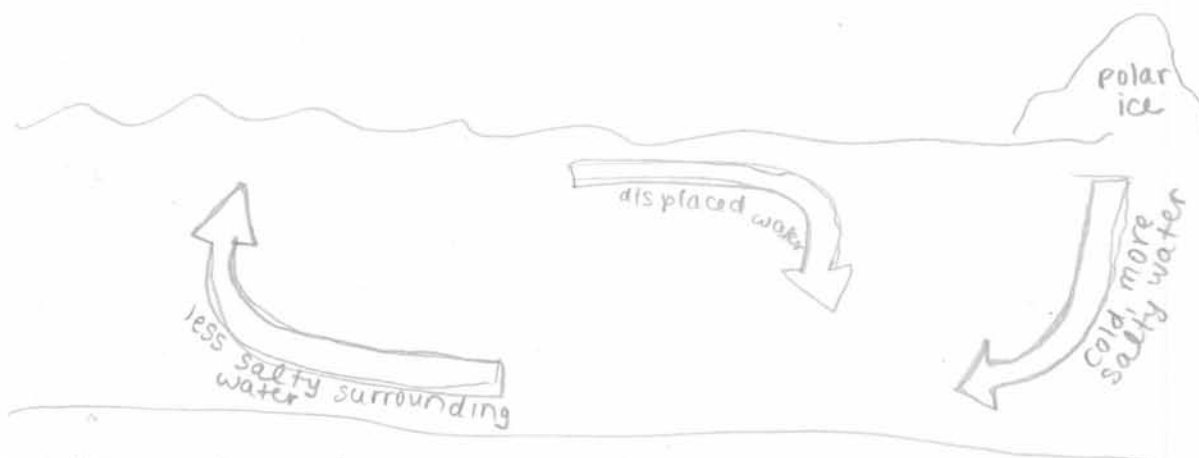
SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water



25

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.



10 If polar ice contained more salt than surrounding water, when the ice melts the water from it will also have a higher salinity. The water from the ice with higher salinity will be more dense than surrounding water and will sink to the bottom of the ocean. Some of the water from the bottom will be forced up because it is less dense than the polar ice water that just sunk. Some of the water at the surface of the oceans will then be displaced by the water from the bottom that was forced up and that surface water may be forced toward the bottom of the ocean. Due to pressure and temperature changes, as well as salinity changes, the waters in the ocean will keep changing density and keep moving in this cyclic fashion. Most likely, if the polar ice contained more salt, it would speed up the thermohaline circulation in oceans because of the effects on the process I described.

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- ☒ c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

40 37

YOUR SCORE:

77

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43856550; GROUP #: S

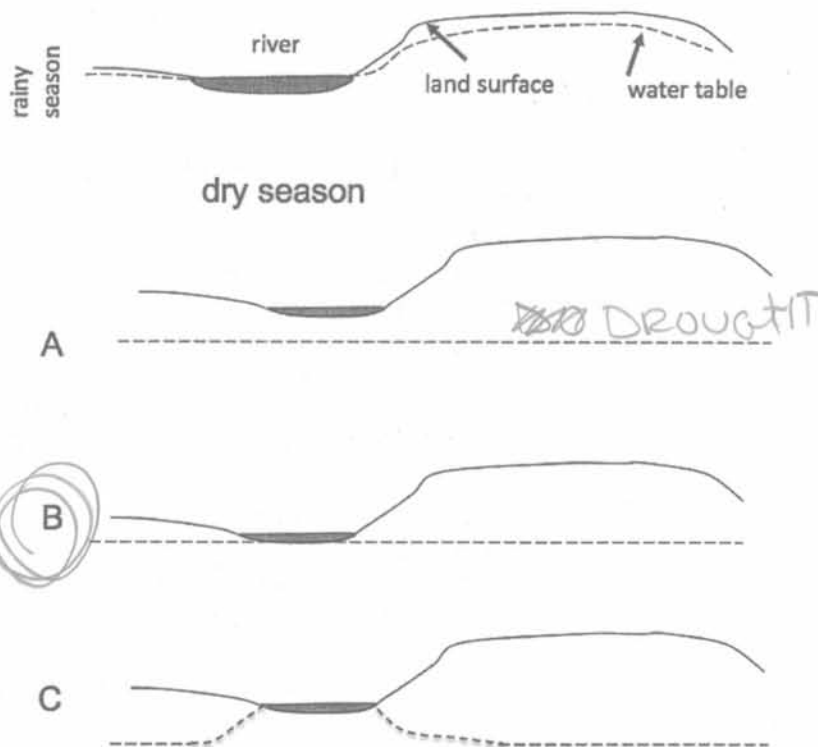
MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- 5
1. What happens when water molecules condense?
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
☒ d. The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
☒ c. Glaciers
d. Lakes and streams
 3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
☒ a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
 4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
~~a. A= evaporation, B= deposition, C= sublimation~~
☒ b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
~~d. A = precipitation, B= freezing, C= condensation~~
 5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
b. Liquid water from the pot evaporates
☒ c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates
 6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. This is what one would predict with global warming
☒ b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

43856550

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.
- a. A= chemical, B= thermal, C= thermal
 - b. A = gravitational, B= gravitational, C= thermal
 - ☒ c. A = gravitational, B= thermal, C= thermal
 - d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



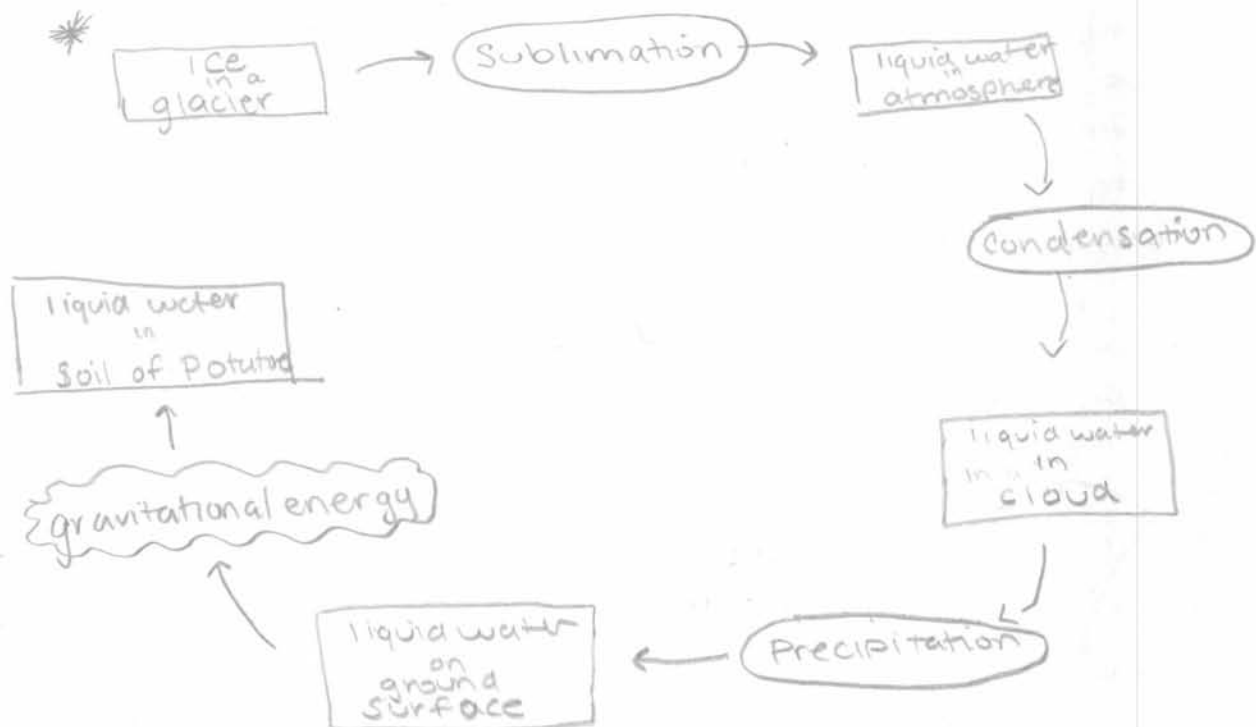
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - ☒ c. remained the same?
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - ☒ b. Plants convert energy into biomass
 - c. Plants release energy

~~4386~~ 43856550 EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

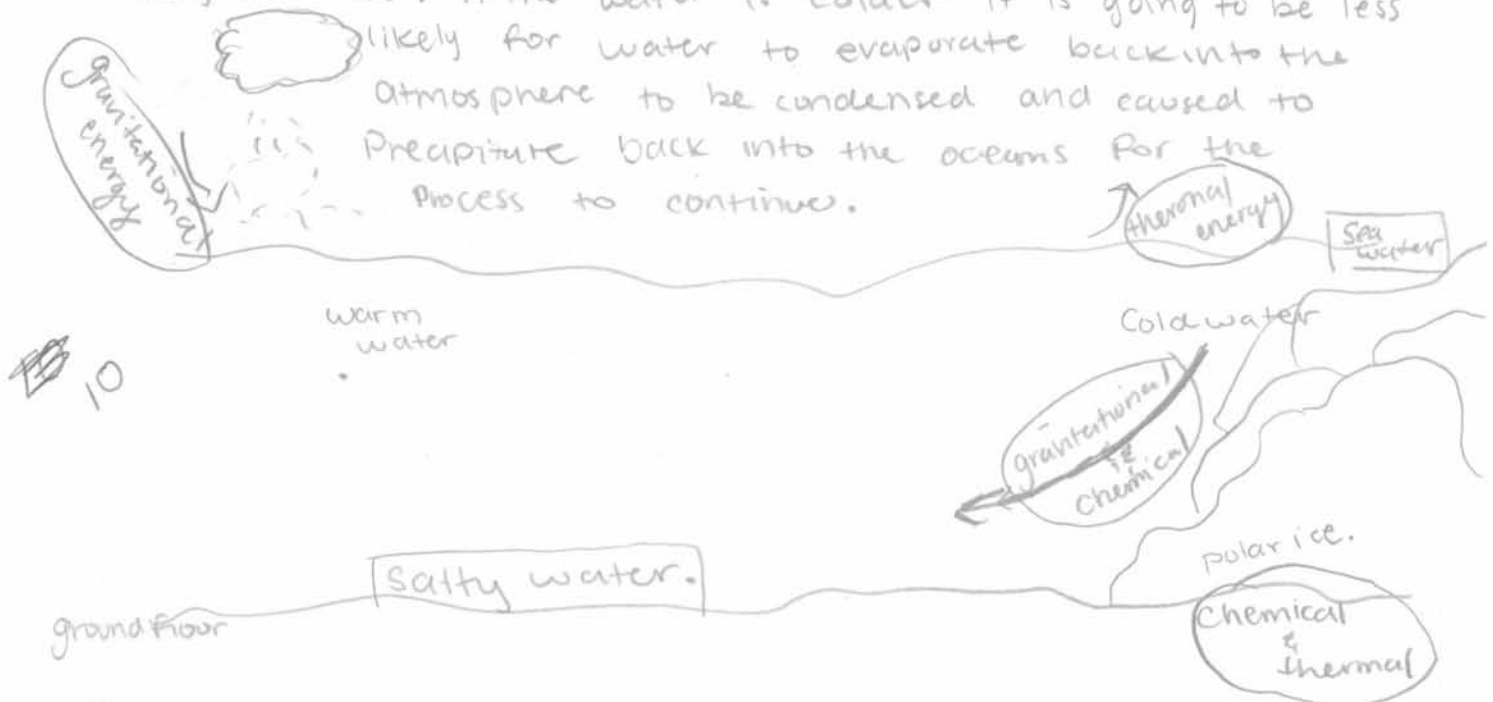
- Water phase at each step in the journey
- A name for each process that moves or transforms water



25

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - The energy that is causing movement or transformation of water.

In the thermohaline circulation in oceans the more dense salty water sinks to the bottom of the ocean floor along with colder water. If the polar ice formed from sea water contained more salt than its surrounding water then it would sink to the ocean floor. I feel as if the ice is more dense and is staying toward the bottom of the ocean floor the water in the oceans would be significantly colder than they are now. If the water is colder it is going to be less likely for water to evaporate back into the atmosphere to be condensed and caused to precipitate back into the oceans for the process to continue.



EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- They both destroy matter during energy conversion
 - They both convert thermal energy into gravitational energy
 - They both convert chemical energy into thermal energy
 - They both convert kinetic energy into potential energy.

25 35
YOUR SCORE:
60

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A39743011; GROUP #: T

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- 6
1. What happens when water molecules condense?
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. ☒ The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
c. ☒ Glaciers
d. Lakes and streams
 3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. ☒ Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
c. Ground water from beneath the surface
 4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
a. A= evaporation, B= deposition, C= sublimation
b. ☒ A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A= precipitation, B= freezing, C= condensation
 5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. ☒ Liquid water from the pot condenses
b. ~~Liquid water from the pot evaporates~~
c. ~~Water vapor from the pot condenses~~
d. Water vapor from the pot evaporates
 6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. ☒ This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

39743811

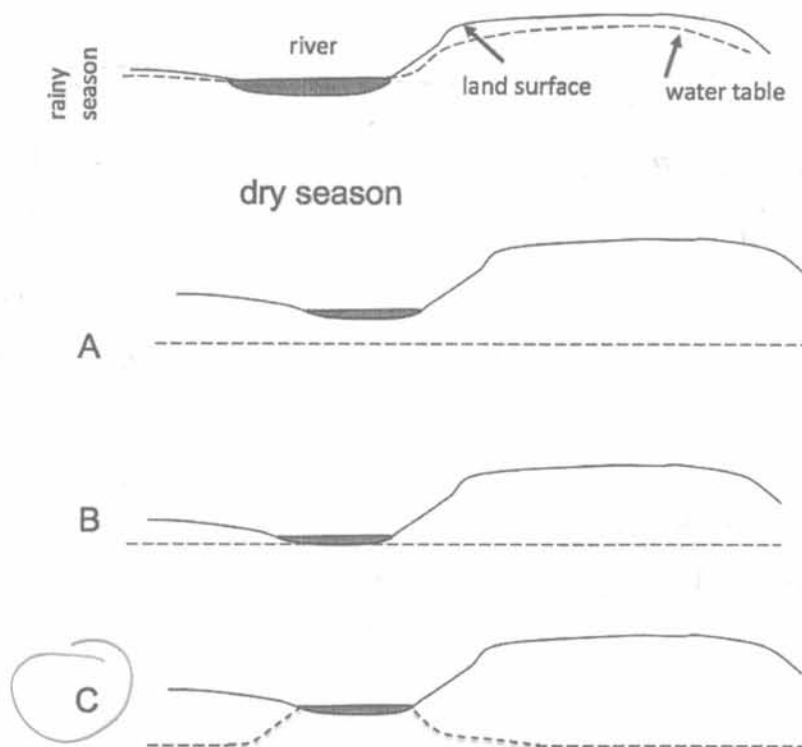
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a) been greater
b. been less
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

39743811

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water *subl.*

Water from the glacier is evaporated into the atmosphere. Once the water is evaporated it the condensates & becomes water vapor in the clouds. The water vapor is then circulated in the atmosphere until it precipitates and rain. The rain the infiltrated the ground & becomes ground water which is then consumed by the potato roots & helps the potato grow.



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

Temperature and salinity in the water drive density. Salt water is more dense than sea water. The density then drives the currents causing warm water to flow to the poles. If there is more salt contained in the ice & it gradually melts it would have an effect on the thermohaline circulation because the more salt that is put into the seawater the more dense it will this will effect both the temperature & salinity? of the water as well as the currents. Chemical & kinetic energy are causing the transformation because the salt is causing a change in the molecular bond & thermal/kinetic is caused by the changing of temperature & the pushing of current.

10

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

30 24

YOUR SCORE:

54

[Forgot ID #]

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A44013916; GROUP #: I

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

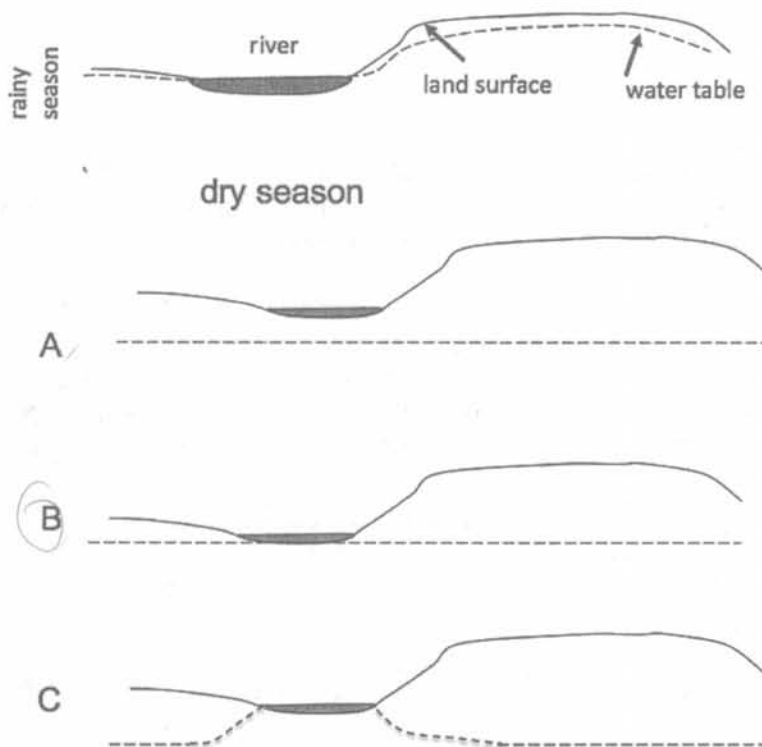
1. What happens when water molecules condense? 7
 - a. Water molecules become larger
 - ☒ b. Gaseous water becomes liquid water
 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - ☒ b. Oceans
 - c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
 - b. Seasonal high water from the Mississippi River
 - ☒ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
 - a. A= evaporation, B= deposition, C= sublimation
 - ☒ b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
 - a. Liquid water from the pot condenses
 - b. Liquid water from the pot evaporates
 - ☒ c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - ☒ a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

44013916

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- ☒ c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - ☒ b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - ☒ b. Plants convert energy into biomass
 - c. Plants release energy

44013916

SHORT ANSWER. 25 points each (50 points total)

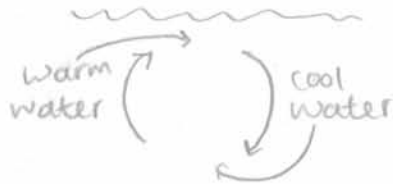
1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
 - b. A name for each process that moves or transforms water

- Water molecule from glacier ^{subl.} evaporates into the air
- The water molecule then becomes in a gaseous state in the atmosphere
- The water vapor then consenses and creates a cloud Phase?
- When there are enough water molecules, the water molecules then fall as liquid molecules as precipitation on a potato field (if that is the correct term?)
- The water molecule then becomes part of surface water
- Through infiltration the water molecule becomes part of ground water and soaks into the potato plant root, which becomes part of the potato.

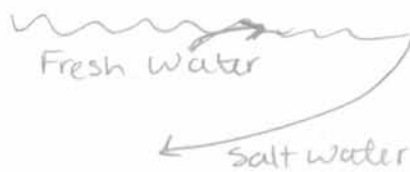
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 - b. The energy that is causing movement or transformation of water.

o Thermohaline circulation in oceans:

The surface, when it's heated up, cools as it sinks.
This would be thermal energy.



Also, ~~sea~~ since salt water is denser than freshwater, the salt water sinks. This also causes circulation.



This is gravitational potential to gravitational kinetic.

Since salt water is denser than freshwater, the seawater is would also be less dense? than just the seawater, therefore having the ice float. If there was more salt in the polar ^{ice} than in surrounding ~~water~~ seawater then the the polar ice would sink and throw the thermohaline circulation off.

10

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

35 32

YOUR SCORE:

67

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

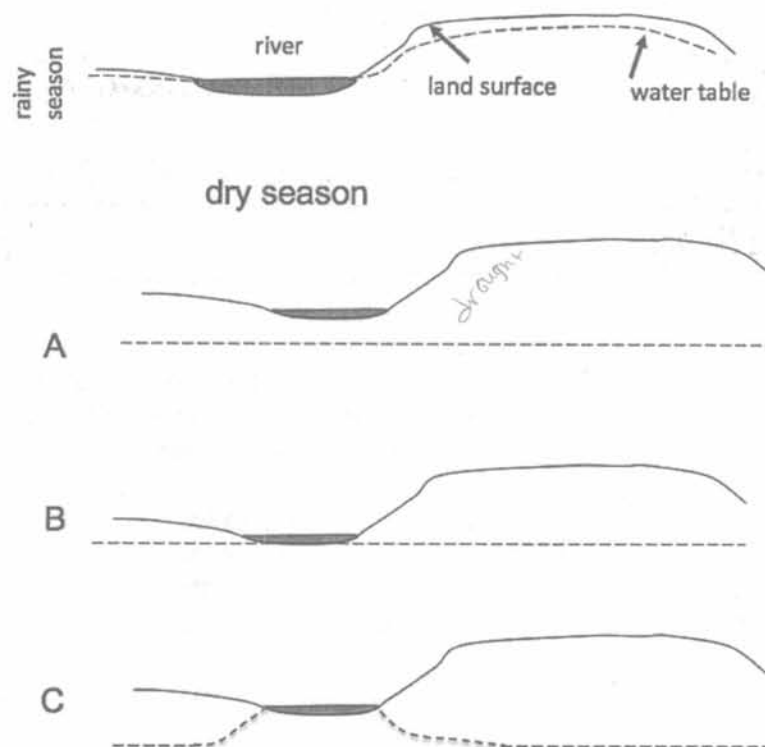
STUDENT ID #: A42185423; GROUP #: T

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense? 6
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
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4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
 - a. A= evaporation, B= deposition, C= sublimation
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 - d. A = precipitation, B= freezing, C= condensation
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 - c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.
- a. A= chemical, B= thermal, C= thermal
 b. A = gravitational, B= gravitational, C= thermal
 c. A = gravitational, B= thermal, C= thermal
 d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

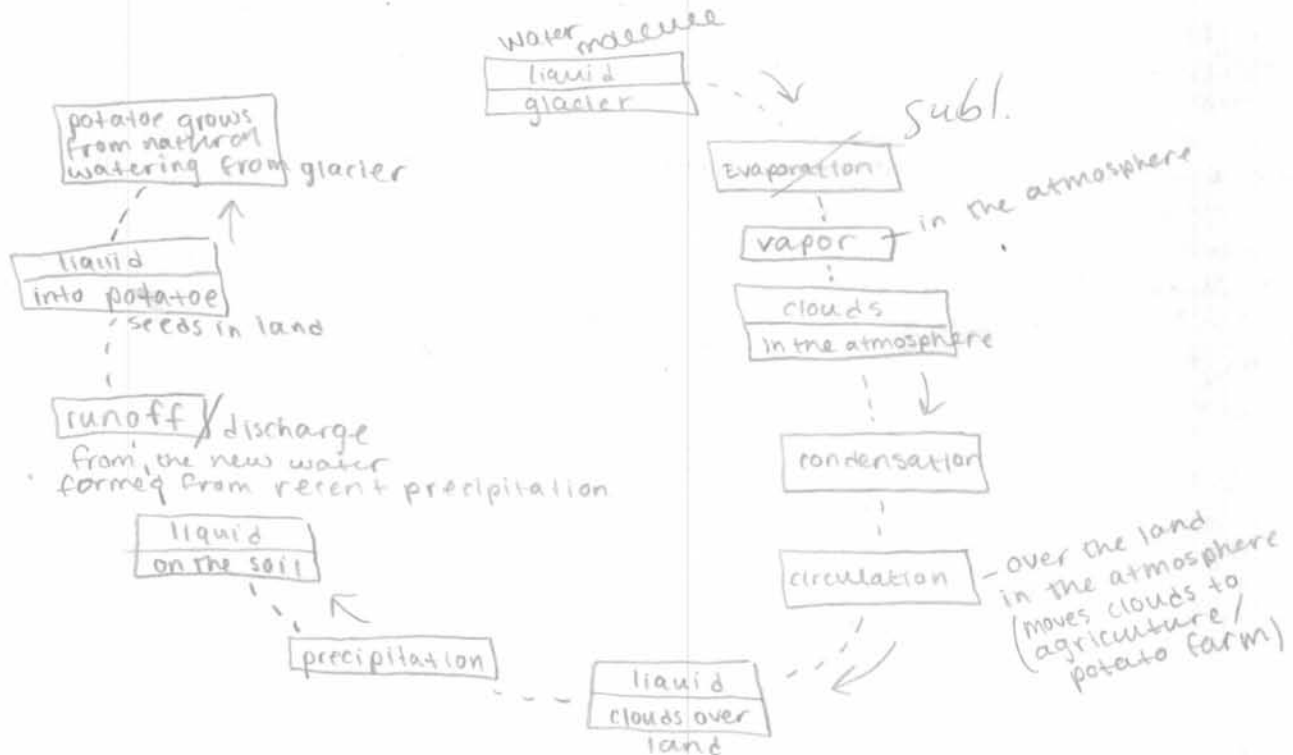


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 b. been less
 c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 b. Plants convert energy into biomass
 c. Plants release energy

42185423

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
 - b. A name for each process that moves or transforms water



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

Thermohaline causes circulation through temperature and salinity. The temperature & salinity of a body of water determine the density of that water. If polar ice contained more salt than the surrounding water than that would change the current circulation. This is because density drives circulation. The energy that is causing movement in this water is gravitational potential to gravitational kinetic. Due to the surrounding density/salinity of the polar ice water being higher it is forcing/pushing the surrounding seawater in a controlled circulation, hence the thermohaline effect.

5

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

30 30
YOUR SCORE:
60

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A39737915; GROUP #: I

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- 8
1. What happens when water molecules condense?
a. Water molecules become larger
☒ b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
☒ c. Glaciers
d. Lakes and streams
 3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
☒ c. Ground water from beneath the surface
 4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
a. A= evaporation, B= deposition, C= sublimation
☒ b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
 5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
a. Liquid water from the pot condenses
☒ b. Liquid water from the pot evaporates—
c. Water vapor from the pot condenses
d. Water vapor from the pot evaporates—
 6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
☒ c. Predictions about global warming do not address global precipitation.

39737915

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

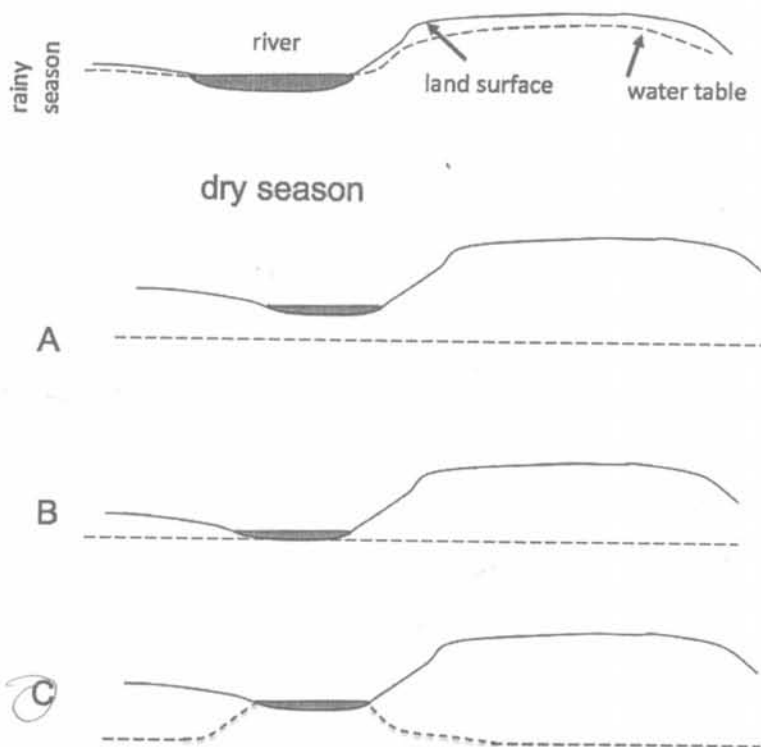
a. A= chemical, B= thermal, C= thermal

b. A = gravitational, B= gravitational, C= thermal

c. A = gravitational, B= thermal, C= thermal

d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0 g/cc . If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

a. been greater

b. been less

c. remained the same

10. What happens when plants respire?

a. Plants convert biomass into energy

b. Plants convert energy into biomass

c. Plants release energy

39737915

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water

- If water starts in a glacier it must first melt due to thermal energy, becoming run off.
- gravitational energy will carry the water liquid to a stream or lake, where it will become surface water.
- Then the water will evaporate, using kinetic energy, and become water vapor in the atmosphere.
- Then the water will circulate
- The water will condense, becoming liquid water in the clouds, using thermal and/or chemical energy
- The potential energy of the water will soon become kinetic gravitational energy as it precipitates onto the field where a potato is planted.
- The water will infiltrate due to gravitational kinetic energy, becoming liquid water in the ground.
- The potato plant can then absorb the water through its roots.

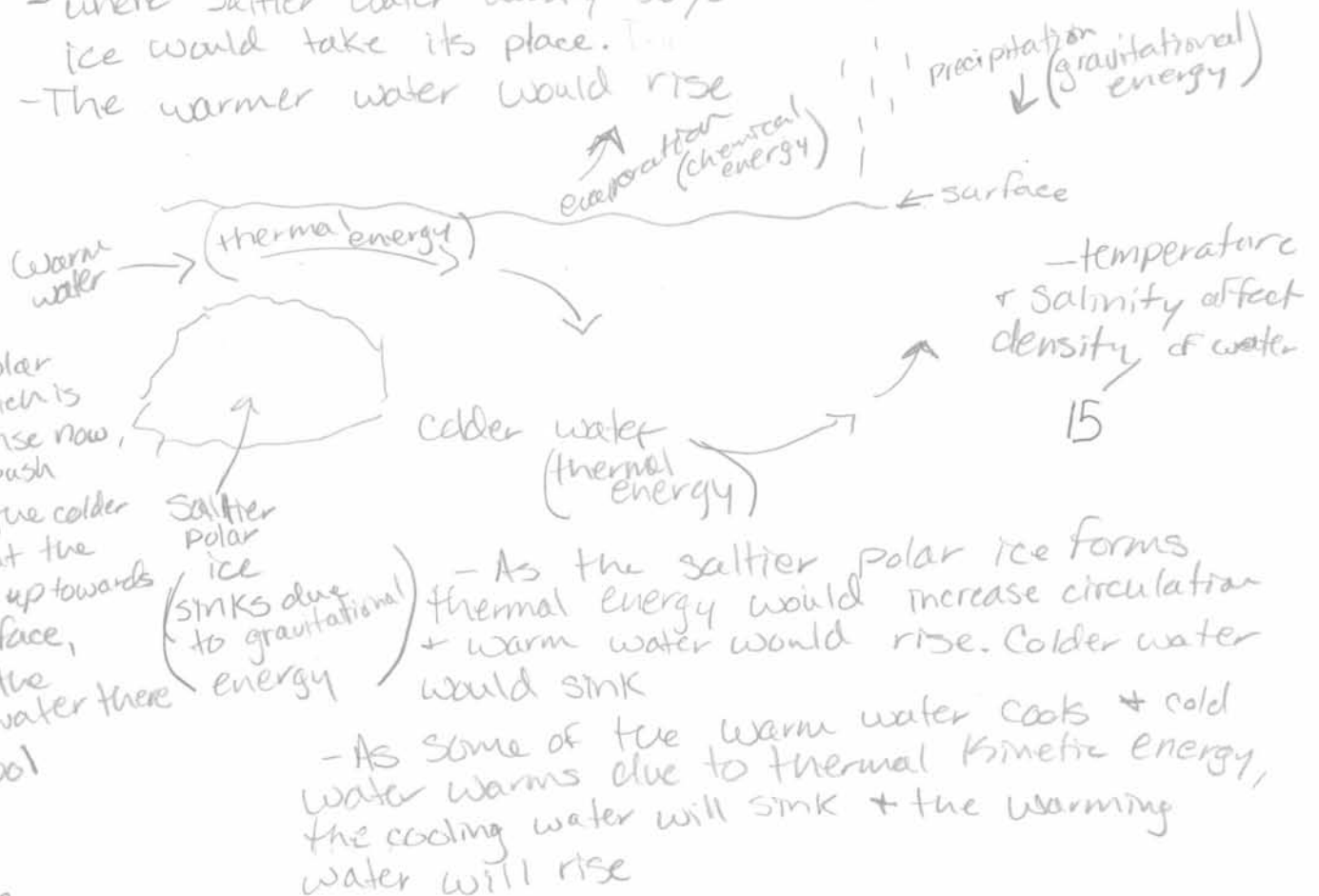


2. When ice forms from seawater, the ice contains less salt than the remaining water.

Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

- An increase in salinity may cause an increase in density.
- the ice may no longer be less dense than the liquid water and could sink
- The balance encouraged by circulation would be disrupted
- where saltier water usually stays towards the bottom, the ice would take its place.
- The warmer water would rise



EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

40 40

YOUR SCORE:

80

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A31630993; GROUP #: X

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- 10
1. What happens when water molecules condense?
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - d. Lakes and streams
 3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
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 - c. Ground water from beneath the surface
 4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
 - a. A= evaporation, B= deposition, C= sublimation
 - b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
 5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
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 6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

31630993

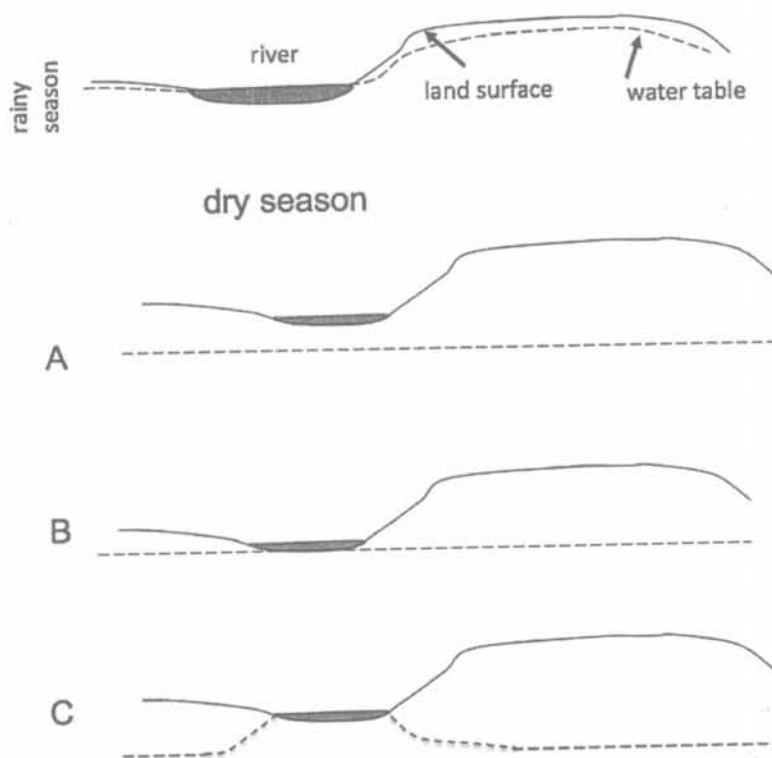
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

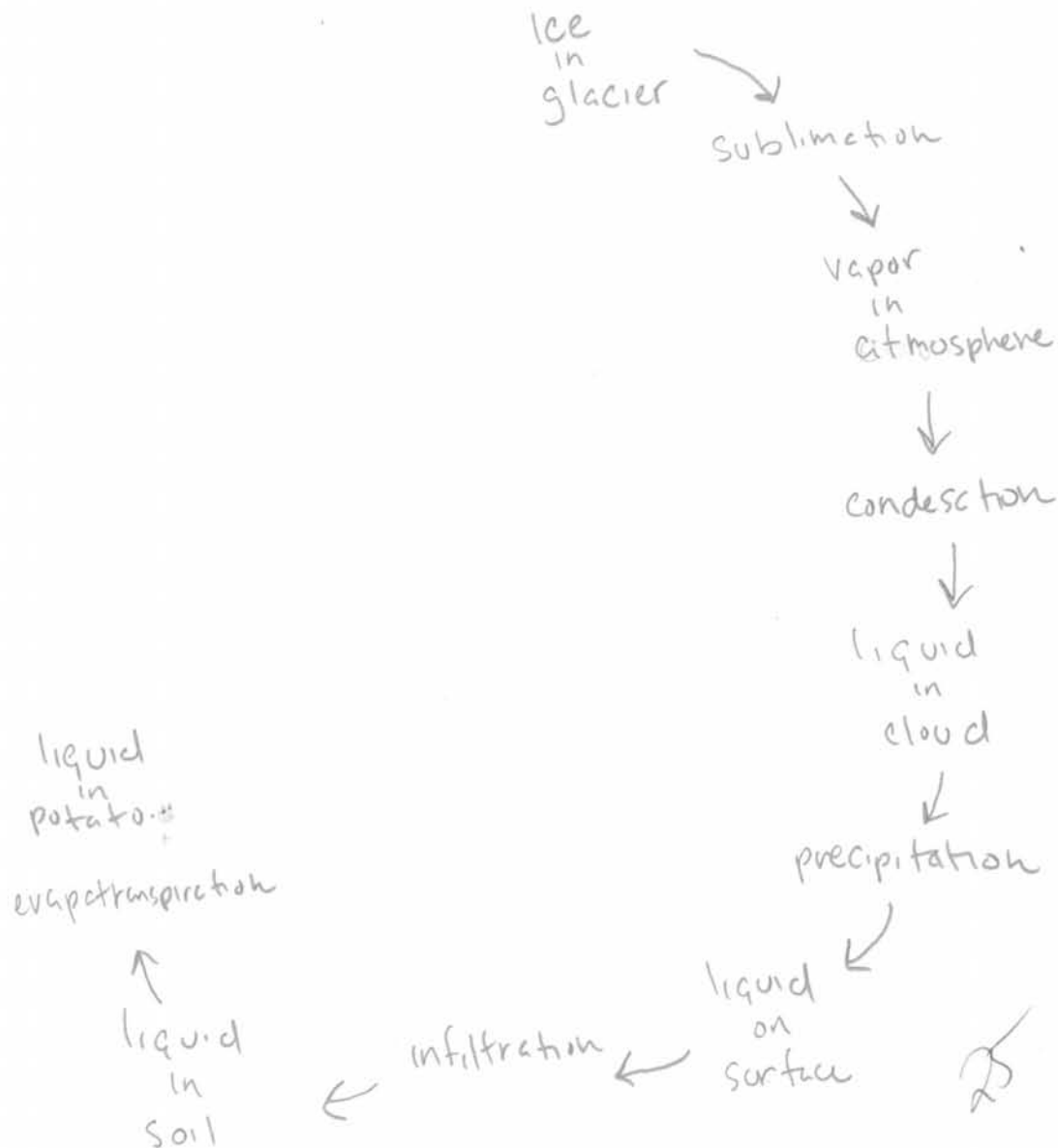


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
b. been less
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
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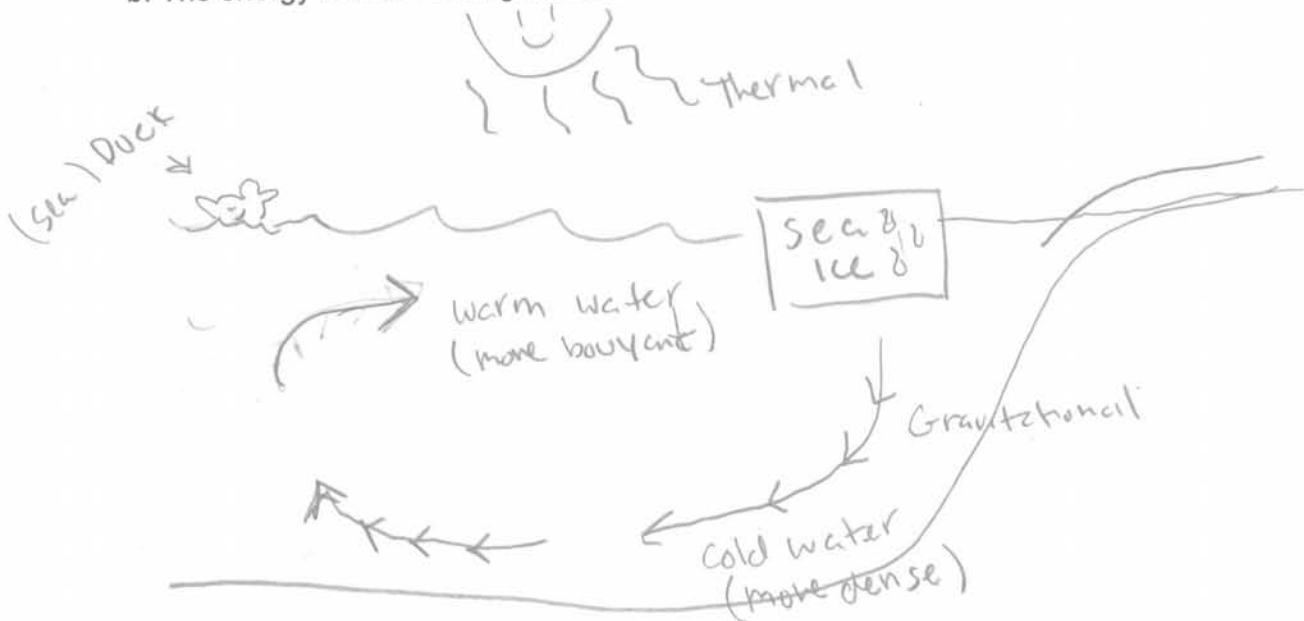
31630993

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
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2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
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 - The energy that is causing movement or transformation of water.



If the polar ice contained more salt than surrounding sea water then thermohaline circulation would move slower than normal or stop completely. Since the cold water melting from the ice would be more dense than the warmer water that rises; it would take longer for the denser, saltier, colder water to heat up and rise to the surface, and slow or stop the circulation.

15 eg → pole

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

50 25 17

YOUR SCORE:

92

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43012134 ; GROUP #: X

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- 5
1. What happens when water molecules condense?
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
☒ d. The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
a. The atmosphere
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43012134

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

_____ - *grav*
_____ - *Soil*

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



dry season

A

B

C

9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:

- a. been greater
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10. What happens when plants respire?

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c. Plants release energy

*Need to be
re-evaluated for*

43012134

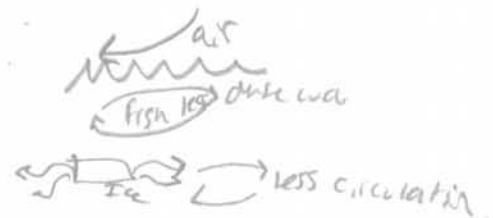
SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
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Thermohaline
Circulation in the ocean involves salty water being more cold and dense and sinks to the ocean bottom. If ice had more salt than sea water then it would be more dense and sink and when the ice would melt it would circulate to the top as much because it would be harder for the heavier water and circulation would decrease if not cease.



- 2 EXTRA CREDIT (2 points)
EC. How are burning wood and respiration similar?
- They both destroy matter during energy conversion
 - They both convert thermal energy into gravitational energy
 - They both convert chemical energy into thermal energy
 - They both convert kinetic energy into potential energy.

25 37

YOUR SCORE:

62

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A43398594; GROUP #: X

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

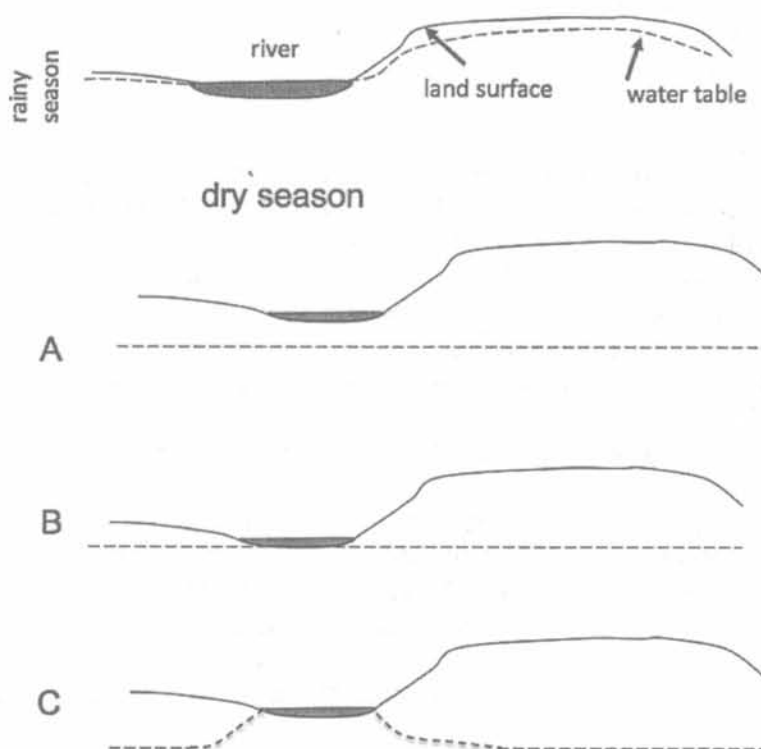
- 5
1. What happens when water molecules condense?
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 - c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - d. Lakes and streams
 3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
 - b. Seasonal high water from the Mississippi River
 - c. Ground water from beneath the surface
 4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
 - a. A= evaporation, B= deposition, C= sublimation
 - b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
 5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
 - a. Liquid water from the pot condenses
 - b. Liquid water from the pot evaporates
 - c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
 6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

43398594

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- A= chemical, B= thermal, C= thermal
- A = gravitational, B= gravitational, C= thermal
- A = gravitational, B= thermal, C= thermal
- A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- been greater
 - been less
 - remained the same
10. What happens when plants respire?
- Plants convert biomass into energy
 - Plants convert energy into biomass
 - Plants release energy

43398594

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
 - b. A name for each process that moves or transforms water



25

2. When ice forms from seawater, the ice contains less salt than the remaining water.

Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

The temperature at which fresher water sits on top of salt water is higher. So as it rises, the water cools and circulates downwards towards the bottom of the ocean. If polar ice contained more salt than surrounding water, then the temperature of the salt water would have to be higher than the fresh water, so as it rises to the top, it then freezes as the polar ice, the fresh water would sink, as salt water rises, leaving the salt molecules.



5



2

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- ☒ They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

YOUR SCORE:

57

STUDENT ID #: A42480810; GROUP #: X

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

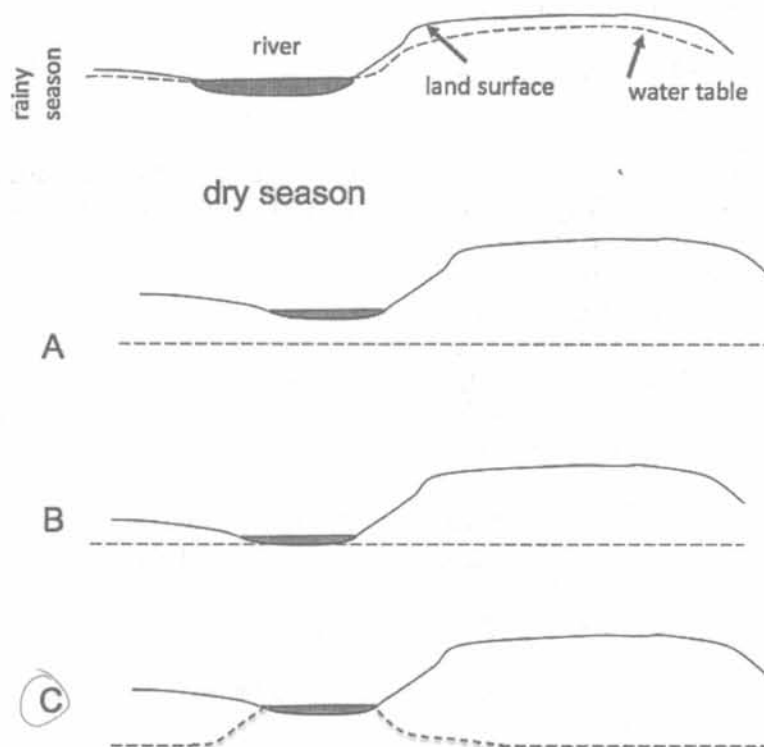
- 9
1. What happens when water molecules condense?
a. Water molecules become larger
☒ b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
☒ c. Glaciers
d. Lakes and streams
 3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
a. Rainfall and surface runoff into the lake
b. Seasonal high water from the Mississippi River
☒ c. Ground water from beneath the surface
 4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of condensation A, then becomes water in a glacier through the process of precipitation B, and then becomes water in clouds through the process of evaporation C.
a. A= evaporation, B= deposition, C= sublimation
☒ b. A = condensation, B= precipitation, C= evaporation
c. A= sublimation, B= precipitation, C= evaporation
d. A = precipitation, B= freezing, C= condensation
 5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
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☒ c. Water vapor from the pot condenses
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 6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
☒ a. This is what one would predict with global warming
b. This is the opposite of what one would predict with global warming
c. Predictions about global warming do not address global precipitation.

42480810

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of grav A thermal energy. Water in the atmosphere becomes water in clouds as a result of thermal B thermal energy. Water in clouds becomes water in the atmosphere as the result of thermal C thermal energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
b. been less
c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

42480810

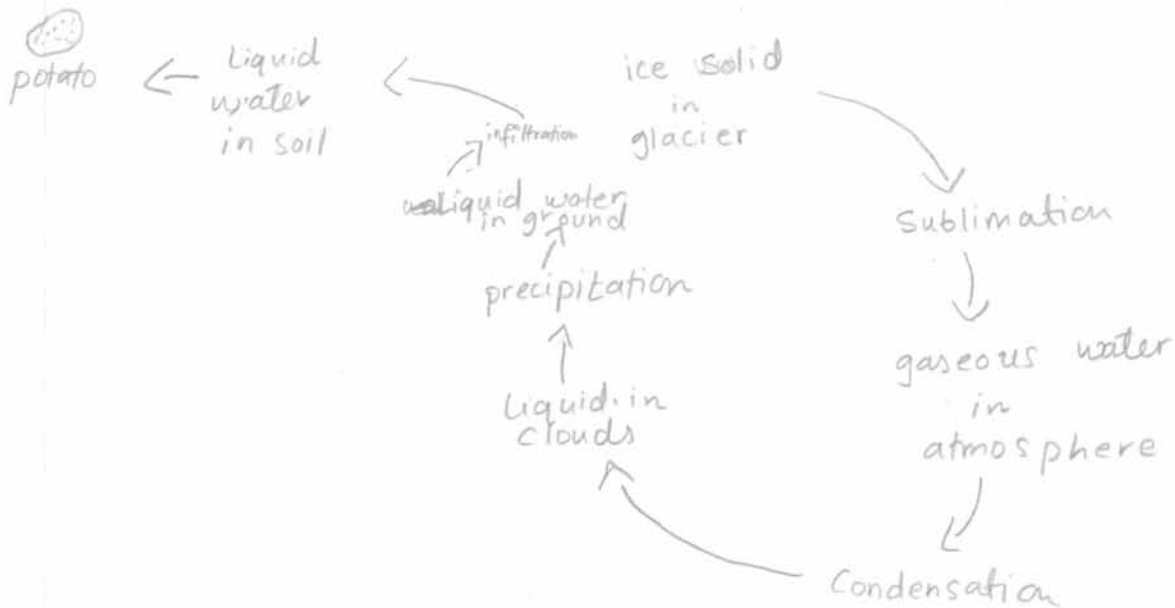
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water

Ice water from the glacier sublimates into gaseous water in the atmosphere which then condenses into Liquid water in clouds. The clouds ~~are~~ then precipitate Liquid water ~~on~~ which rains down on the ground surface. ~~The~~ Some water infiltrates the soil and reaches the potato in Liquid form.



25

2. When ice forms from seawater, the ice contains less salt than the remaining water.

Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

Thermohaline circulation takes place due to the differences in density due to water salinity and water temperature. Warm water which is less dense circulates towards the North Atlantic from the equator. The warm water is cooled at the pole, it also melts ^{as cold water} some of the ~~ice~~ glacier ice, sinks to the bottom, and circulates back to the equator. If the glacier ice contained more salt then there will be more cold ^{salty} water sinking at the bottom of the ocean and circulating back to the equator. The energy that powers this circulation is solar energy or the Sun since the water in the equatorial region is warmed by it. +?

20

EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- They both destroy matter during energy conversion
- They both convert thermal energy into gravitational energy
- They both convert chemical energy into thermal energy
- They both convert kinetic energy into potential energy.

45 25 22

YOUR SCORE:

92

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A37417357; GROUP #: 4

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

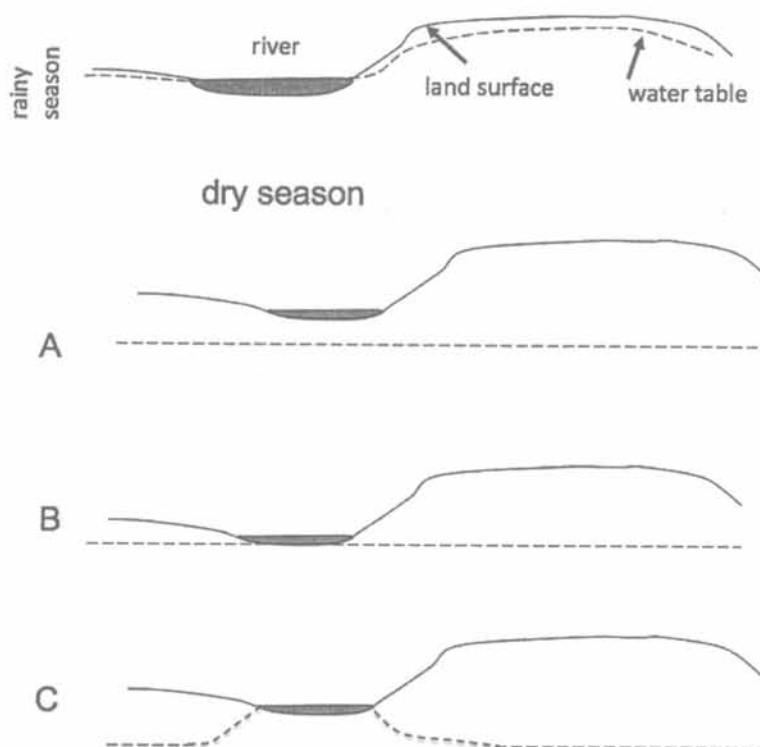
1. What happens when water molecules condense? 4
 - a. Water molecules become larger
 - b. Gaseous water becomes liquid water
 - ☒ c. Hydrogen and oxygen atoms combine to form liquid water
 - d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - ☒ d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - ☒ a. Rainfall and surface runoff into the lake
 - b. Seasonal high water from the Mississippi River
 - c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
 - a. A= evaporation, B= deposition, C= sublimation
 - b. A = condensation, B= precipitation, C= evaporation
 - c. A= sublimation, B= precipitation, C= evaporation
 - d. A = precipitation, B= freezing, C= condensation
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
 - a. Liquid water from the pot condenses
 - b. Liquid water from the pot evaporates
 - ☒ c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - ☒ c. Predictions about global warming do not address global precipitation.

37417357

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



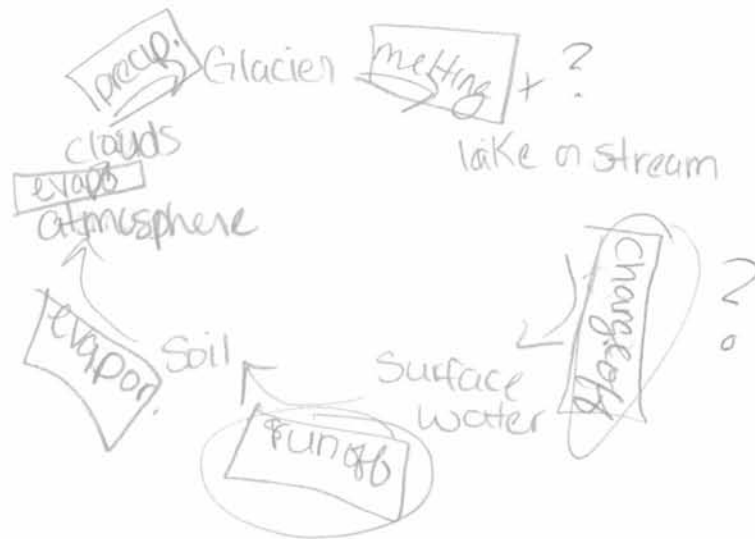
9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
 - b. Plants convert energy into biomass
 - c. Plants release energy

37417357

EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- Water phase at each step in the journey
 - A name for each process that moves or transforms water



PHASE?

10

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

I don't think it would change the circulation. I do think that it would take longer to freeze because of the amount of salt. I also think that the energy would be chemical to thermal energy it would also be potential energy. ? 2

EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- a. They both destroy matter during energy conversion
 - b. They both convert thermal energy into gravitational energy
 - c. They both convert chemical energy into thermal energy
 - d. They both convert kinetic energy into potential energy.

YOUR SCORE:

32

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A42177911; GROUP #: Y

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense? 6
 - a. ~~Water molecules become larger~~
 - b. Gaseous water becomes liquid water
 - c. ~~Hydrogen and oxygen atoms combine to form liquid water~~
 - d. ~~The temperature of water molecules decreases~~
2. Which of the following is the largest freshwater reservoir
 - a. The atmosphere
 - b. Oceans
 - c. Glaciers
 - d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
 - a. Rainfall and surface runoff into the lake
 - b. Seasonal high water from the Mississippi River
 - c. ~~Ground water from beneath the surface~~
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
 - a. ~~A = evaporation, B = deposition, C = sublimation~~
 - b. A = condensation, B = precipitation, C = evaporation
 - c. A = sublimation, B = precipitation, C = evaporation
 - d. ~~A = precipitation, B = freezing, C = condensation~~
5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
 - a. ~~Liquid water from the pot condenses~~
 - b. ~~Liquid water from the pot evaporates~~
 - c. Water vapor from the pot condenses
 - d. Water vapor from the pot evaporates
6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
 - a. This is what one would predict with global warming
 - b. This is the opposite of what one would predict with global warming
 - c. Predictions about global warming do not address global precipitation.

42177911

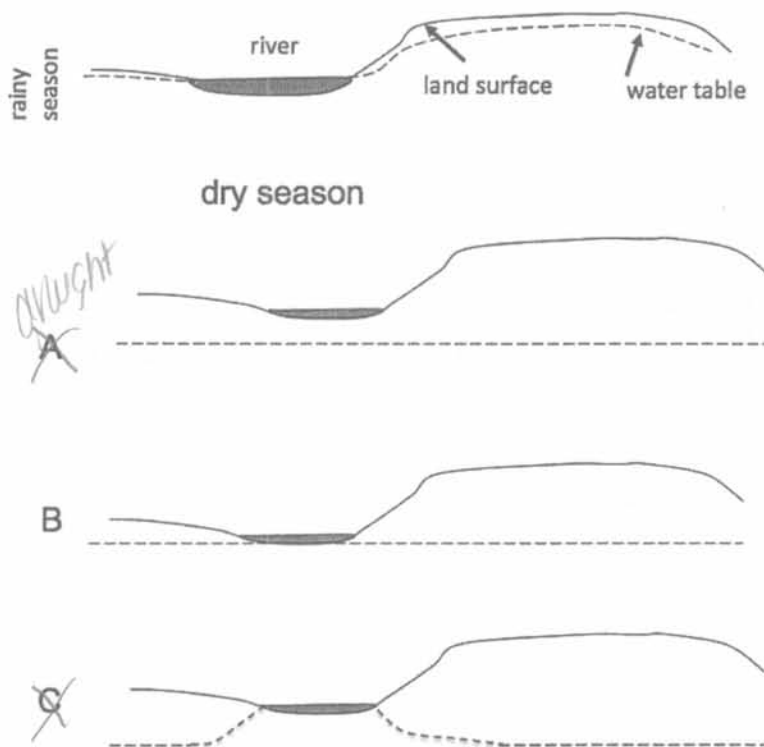
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?

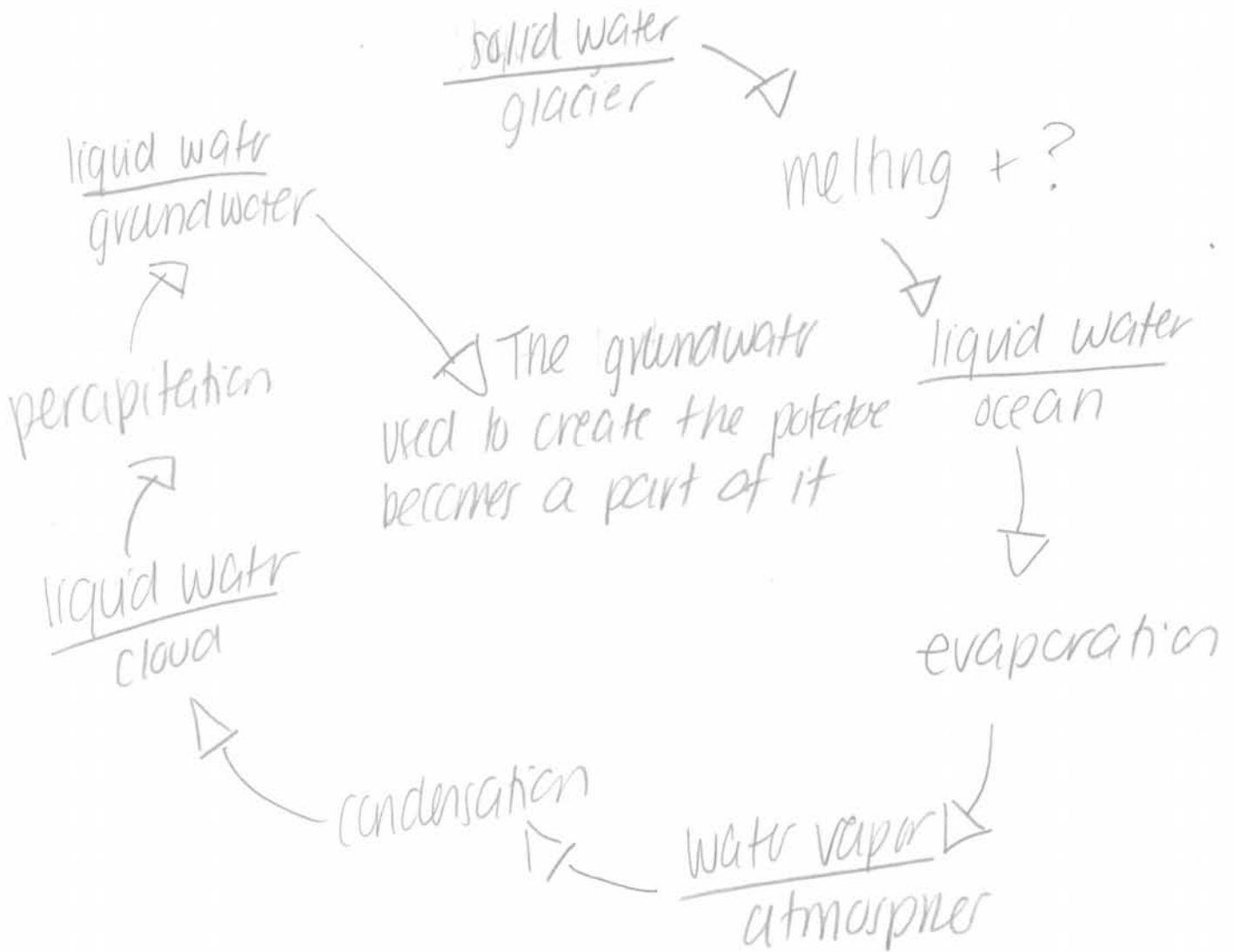


9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- a. been greater
b. been less
☒ remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
b. Plants convert energy into biomass
c. Plants release energy

42177911

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
 - b. A name for each process that moves or transforms water



23

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
b. The energy that is causing movement or transformation of water.

2 Circulation occurs as the warmer water is less ^{SALT} dense than the colder water. This allows for the warm water to rise + the cold water to sink. As density determines where the water is placed, it also determines how it circulates. Water has the ability to hold in heat for a long period of time, however when it does cool the warm air then becomes cold, sinking it + allowing the cold water to become warm + rise. If the warm water consistently stayed warm the polar region would not only have heat carried to it, but significantly warm the polar region. The containment of less salt within ice allows for density to help along this process. If that ^{flow?} density changed, the movement may change.

2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
b. They both convert thermal energy into gravitational energy
c. They both convert chemical energy into thermal energy
d. They both convert kinetic energy into potential energy.

YOUR SCORE:

57

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A 42837704; GROUP #: Y

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?
a. Water molecules become larger
☒ b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
b. Oceans
c. Glaciers
☒ d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
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b. Seasonal high water from the Mississippi River
☒ c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of ____A____, then becomes water in a glacier through the process of ____B____, and then becomes water in clouds through the process of ____C____.
a. A= evaporation, B= deposition, C= sublimation
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☒ a. This is what one would predict with global warming
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42837704

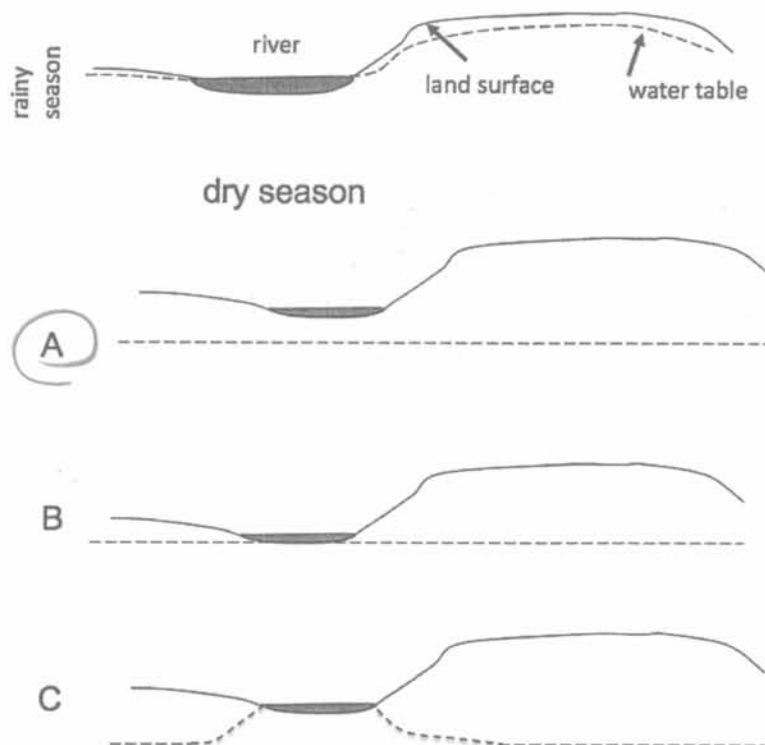
ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
- b. A = gravitational, B= gravitational, C= thermal
- ☒ c. A = gravitational, B= thermal, C= thermal
- d. A= thermal, B= thermal, C= thermal

8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- ☒ a. been greater
 - b. been less
 - c. remained the same
10. What happens when plants respire?
- a. Plants convert biomass into energy
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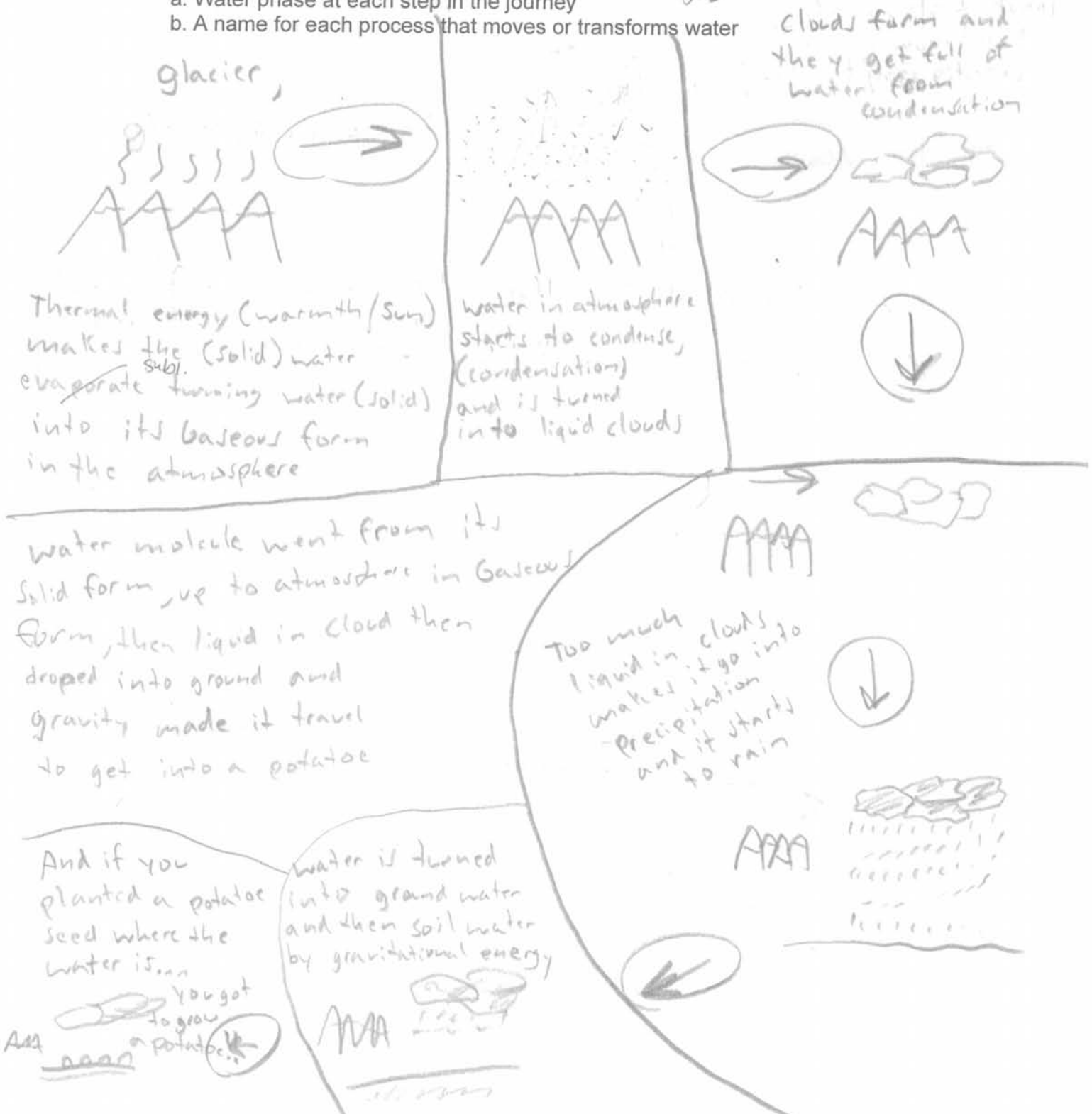
42837704

SHORT ANSWER. 25 points each (50 points total)

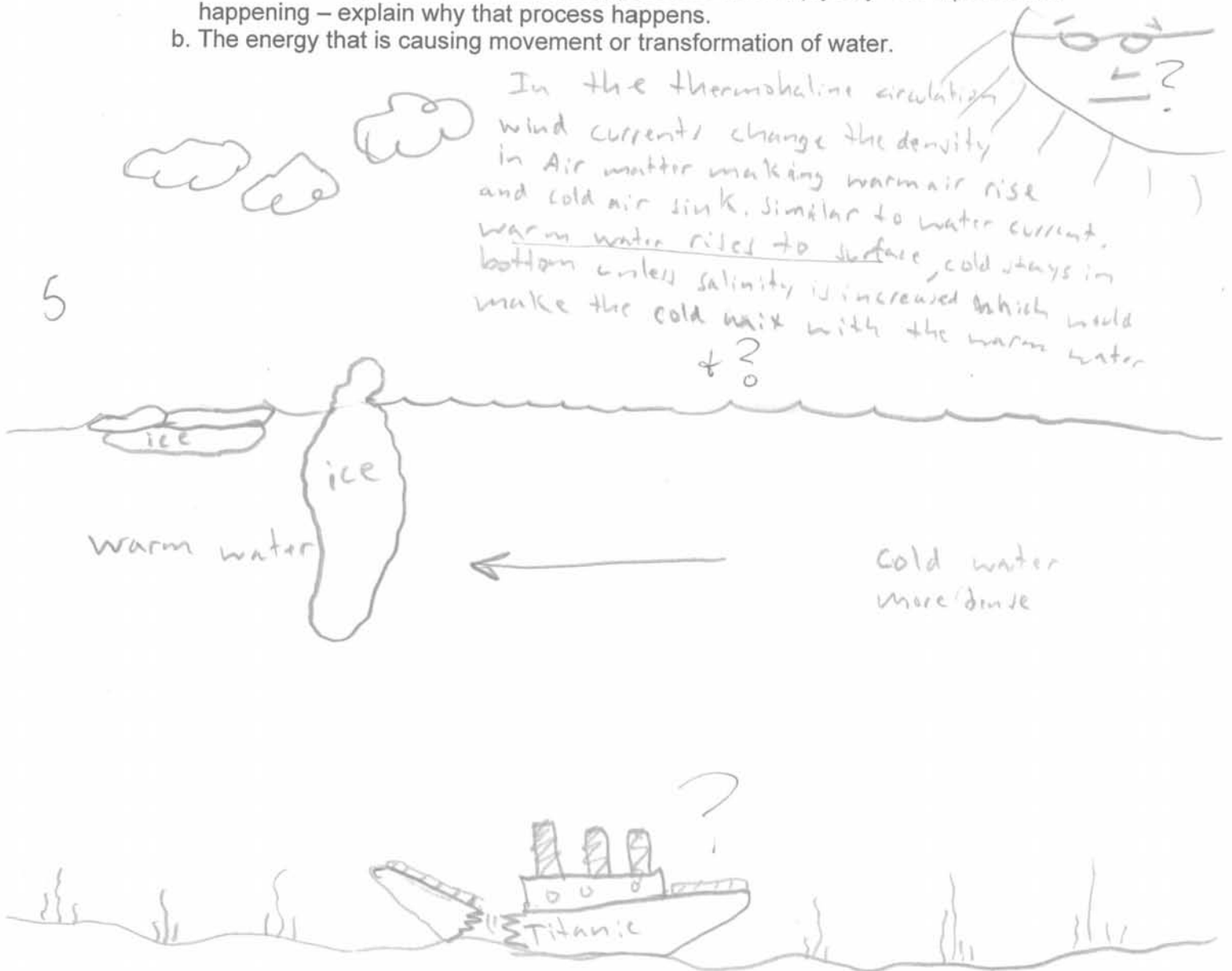
1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water

23



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
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2 EXTRA CREDIT (2 points)

EC. How are burning wood and respiration similar?

- a. They both destroy matter during energy conversion
- b. They both convert thermal energy into gravitational energy
- ☒ c. They both convert chemical energy into thermal energy
- d. They both convert kinetic energy into potential energy.

YOUR SCORE:

60

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A40491423; GROUP #: 4

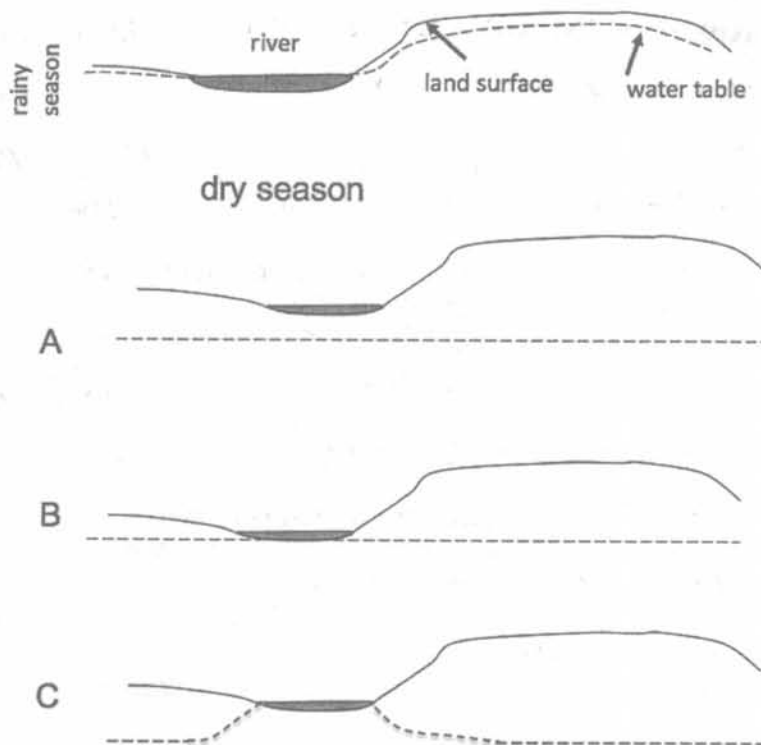
MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. What happens when water molecules condense?
a. Water molecules become larger
b. Gaseous water becomes liquid water
c. Hydrogen and oxygen atoms combine to form liquid water
d. The temperature of water molecules decreases
2. Which of the following is the largest freshwater reservoir
a. The atmosphere
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c. Glaciers
d. Lakes and streams
3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
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c. Ground water from beneath the surface
4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
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b. A = condensation, B= precipitation, C= evaporation
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b. This is the opposite of what one would predict with global warming
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40491423

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.
- A = chemical, B = thermal, C = thermal
 - A = gravitational, B = gravitational, C = thermal
 - A = gravitational, B = thermal, C = thermal
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8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- been greater
 - been less
 - remained the same
- ice < water
ice >
10. What happens when plants respire?
- Plants convert biomass into energy
 - Plants convert energy into biomass
 - Plants release energy

40491423

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:

- Water phase at each step in the journey
- A name for each process that moves or transforms water

glacier → ocean → cloud → surface water → ground water
↓
potato growing

MISSING
STEP

A water molecule could start out in a glacier. By the process of the glacier melting, the water molecule would move into an ocean. Then, through condensation the water molecule could move from the ocean into a cloud. By precipitation, the water molecule could then leave the cloud and end up as surface water of the earth. At this point, a potato could be planted at the same spot as the water molecule at surface level is located. As the potato grows, it would utilize the ground and surface water and, therefore, the water molecule would then be part of the potato.

PHASE?

15



2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:

- Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
- The energy that is causing movement or transformation of water.

If polar ice contained more salt than the surrounding seawater from which it freezes then thermohaline circulation would be the opposite from what it is now. However, the overall salt content of both oceans and glaciers would remain the same. If glaciers had more salt, once the glaciers melt, the oceans would have more salt. The process would continue and the salt content of both oceans and glaciers would remain the same. When the ocean water freezes to glaciers then the glaciers would have more salt but it would even out once the glaciers melt back into the ocean, if

more salt than remains
water, even more salt in
seawater → ice = freezing

2

2 EXTRA CREDIT (2 points)

- EC. How are burning wood and respiration similar?
- They both destroy matter during energy conversion
 - They both convert thermal energy into gravitational energy
 - ☒ They both convert chemical energy into thermal energy
 - They both convert kinetic energy into potential energy.

YOUR SCORE:

49

ISP 203A: GLOBAL CHANGE
EXAM #1; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A 35919773; GROUP #: Y

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- 5
1. What happens when water molecules condense?
☐ a. Water molecules become larger
☐ b. Gaseous water becomes liquid water ✓
☐ c. Hydrogen and oxygen atoms combine to form liquid water
☐ d. The temperature of water molecules decreases
 2. Which of the following is the largest freshwater reservoir
☐ a. The atmosphere
☐ b. Oceans
☐ c. Glaciers
☐ d. Lakes and streams
 3. There is a lake on my farm along the Mississippi River. There are no streams running into the lake. Where does most of the water in the lake come from?
☐ a. Rainfall and surface runoff into the lake
☐ b. Seasonal high water from the Mississippi River
☐ c. Ground water from beneath the surface
 4. Fill in the blanks. Water in the atmosphere becomes water in a cloud through the process of A, then becomes water in a glacier through the process of B, and then becomes water in clouds through the process of C.
☐ a. A= evaporation, B= deposition, C= sublimation
☐ b. A = condensation, B= precipitation, C= evaporation
☐ c. A= sublimation, B= precipitation, C= evaporation
☐ d. A = precipitation, B= freezing, C= condensation
 5. When a teapot boils we see a white cloud rising from the spout. Why does the white cloud form?
☐ a. Liquid water from the pot condenses
☐ b. Liquid water from the pot evaporates
☐ c. Water vapor from the pot condenses
☐ d. Water vapor from the pot evaporates
 6. 2010 was the warmest year on record. It was also the wettest, meaning there was record precipitation. Which of the following statements is most accurate?
☐ a. This is what one would predict with global warming
☐ b. This is the opposite of what one would predict with global warming
☐ c. Predictions about global warming do not address global precipitation.
warmer → more evaporation
→ more precipitation

35919773

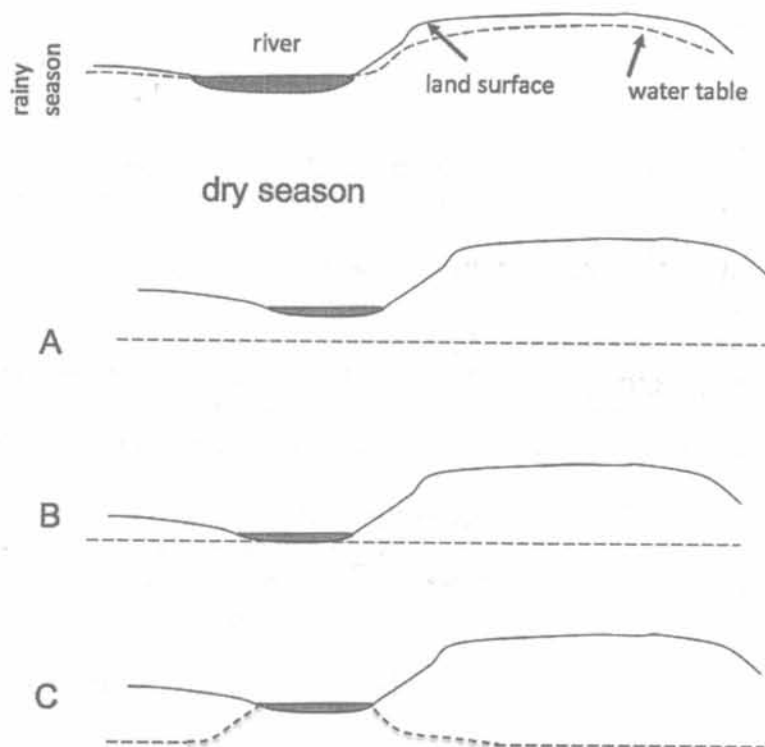
ISP 203A: GLOBAL CHANGE
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2

7. Fill in the blanks. Water on the ground becomes water in the soil as a result of _____ A _____ energy. Water in the atmosphere becomes water in clouds as a result of _____ B _____ energy. Water in clouds becomes water in the atmosphere as the result of _____ C _____ energy.

- a. A= chemical, B= thermal, C= thermal
b. A = gravitational, B= gravitational, C= thermal
c. A = gravitational, B= thermal, C= thermal
d. A= thermal, B= thermal, C= thermal

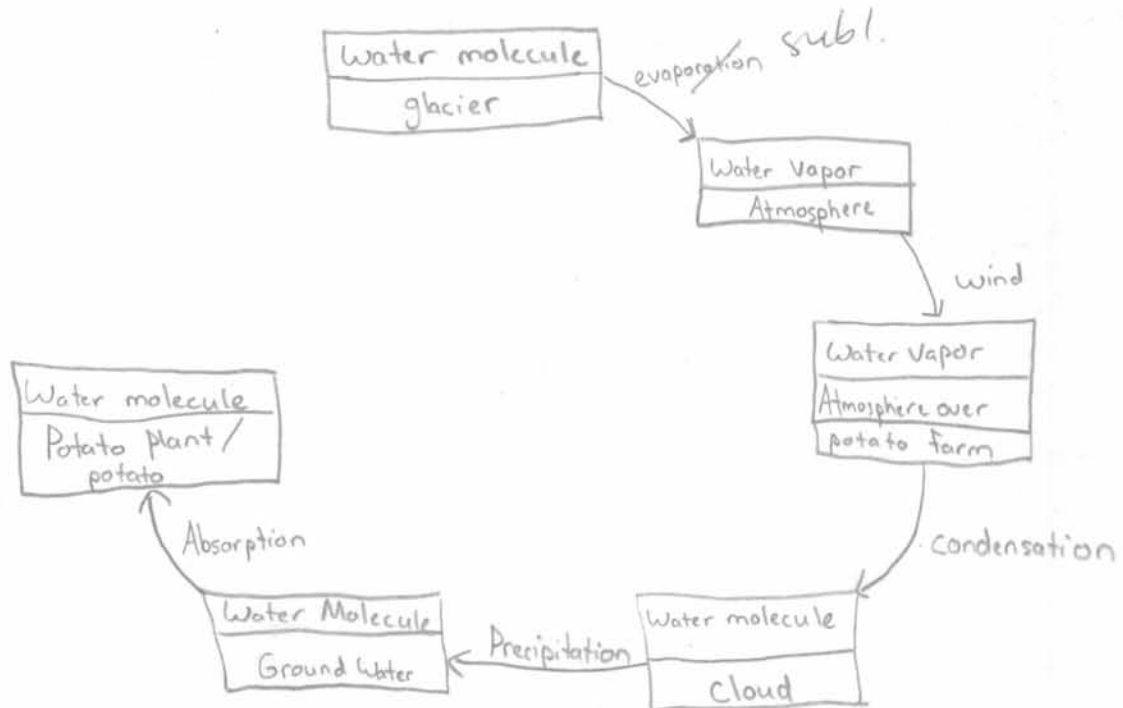
8. The drawing to the right represents a slice through the earth with the dashed line representing the water table. If the top diagram represents an area during the rainy season, which figure would best represent that same region during a dry season?



9. We can calculate the rise in sea level due to melting glaciers. In that calculation, we need to know that the density of ice is 0.9 g/cc and the density of liquid water is 1.0g/cc. If the density of ice were greater than the density of water, then the calculated rise in sea level would have:
- been greater
 - been less
 - remained the same
10. What happens when plants respire?
- Plants convert biomass into energy
 - Plants convert energy into biomass
 - Plants release energy

SHORT ANSWER. 25 points each (50 points total)

1. Provide an explanation for how a water molecule could naturally move from a glacier to become part of a potato. You are encouraged to use lists, pictures, and/or tables in your explanation. Your explanation must include:
- a. Water phase at each step in the journey
 - b. A name for each process that moves or transforms water



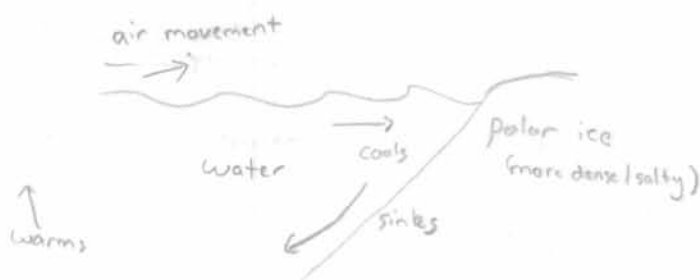
What is Phase?

~~21~~ 21

2. When ice forms from seawater, the ice contains less salt than the remaining water. Describe how thermohaline circulation in oceans would change, if at all, if polar ice contained more salt than the surrounding seawater from which it freezes. You are encouraged to use lists, pictures, tables or other visuals in your explanation. Your explanation must include:
- a. Clear reasoning for why circulation happens. Do not simply say that a process is happening – explain why that process happens.
 - b. The energy that is causing movement or transformation of water.

IF ice from glaciers had more salt than the water that becomes part of it, there would be less concentrated salt levels in the water around the glaciers. That would make the water less dense, therefore [slightly increasing the temperature] Thermohaline circulation would then cycle closer to the glaciers, because they could travel closer to them before cooling down. However, most water movement is due to air circulation, so this warming would only really have an effect on the water circulation if the air's movement changed.

5



2 EXTRA CREDIT (2 points)

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25 28

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53